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# THE JOURNAL OF THE ROYAL ARTILLERY

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Vol. XLII. No. 11.

February, 1916.



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\* On page 561, this officer's initials are inadvertently shown as "W. P. K."

  
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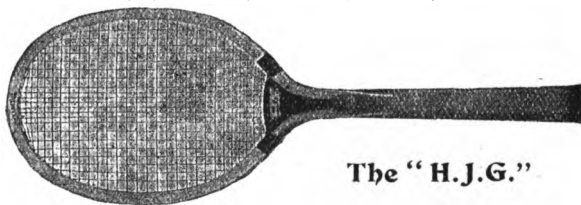
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## FROM FACTORY TO FIRING-LINE.

“The life-story of a piece of cotton used for military purposes”.

BY CAPTAIN O. F. G. HOGG, R.G.A.

SOME little time ago, newspapers were full of articles dealing with the “Contraband of Cotton.” Different journals exploited the subject with varying degrees of energy. Some declared that the Government should have made cotton an absolute contraband of war very much earlier in the campaign, and insisted that it should be made so at once, hinting that the authorities had been negligent in this matter. Now whether or not this step should have been taken was purely a matter of policy for His Majesty’s Government to decide, and as such, has nothing to do with this article. It was however the various arguments for and against, and statements made one day and denied another, doubtless very confusing to “the man in the street” which has led me to sketch out simply and shortly without going into any technical details, the part cotton plays in war.

In one morning paper was constantly to be seen something after the following style: “Sir William Ramsay says cotton is used for high explosives. High explosives are an essential in this war. The Government has not yet made cotton contraband.” Somewhere else this was contradicted, stating that high explosives were practically all made from coal tar derivatives, and had nothing to do with cotton. To the ordinary reader this is very confusing and he wonders where the truth lies. He asks himself the question “Is cotton all important for military purposes?, or can its use be replaced?”.

Both statements as they stand are true, but in order to understand them it will be necessary to explain the terms “explosive” and “high explosive.”

An explosive is a solid or liquid substance or mixture of substances, which is liable on the application of heat or a blow to a small portion of the mass, to be converted in a very short interval of time into other more stable substances, either largely or wholly gaseous. From its definition then, it must be an endothermic unstable compound which is ready at all times to break up into a number of exothermic stable substances.

Explosives are conveniently classed under two main headings:

- (a) Propellants.
- (b) Disruptives.

A propellant is an explosive such that its rate of decomposition can to some extent be regulated within certain time limits, i.e. its rate of burning can be controlled and is comparatively speaking slow. Thus members of this class are sometimes known as “slow burning powders” or low explosives”.

As their name implies, they are used for purposes of propulsion, such as that of a projectile out of a gun. Being slow in their action they allow the inertia of the shell to be overcome, so that the pressure



behind it gradually increases to a maximum, without too great a strain being thrown on the weapon.

They explode or burn by means of an "explosion proper." A "proper explosion" is in reality a rapid combustion. They burn in layers from the outside towards the centre, each layer being consumed before the next takes fire. Physically there is no difference between the burning of a prism of gunpowder, and the rusting of an iron nail. Both are examples of combustion with a combination of oxygen in each case.

A disruptive on the other hand is a substance used for a shattering effect. It does not explode in the true sense of the term, it detonates. Detonation is a wave-length and is extremely rapid. So rapid that the inertia of bodies lying close by are not so much overcome as disintegrated. It takes place throughout the mass at about 4 miles a second, and thus for all practical purposes is instantaneous. Naturally the rate varies with different compounds from about  $2\frac{3}{4}$  miles up to  $4\frac{1}{4}$  miles per second. It is independent of the amount of the substance, and more or less of the temperature, although the latter does alter it slightly.

Thus, as the brisance or power of a disruptive is high and the time of detonation very short, powdering of surrounding objects is a more likely occurrence than their projection. Disruptives are therefore known as "high explosives".

A high explosive to act as such must be detonated. It may of course be burnt but then it explodes and does not detonate, and thus its power and usefulness is lost. For this reason it must be set in action by a detonator, which is composed of a substance so quick in its disintegration, that about  $1/3000$ th part of a second after it has been fired, the explosion passes to detonation which in turn communicates the wave to the high explosive in question. Detonators are mainly composed of such substances as fulminate of mercury, or lead azide.

Under certain conditions propellants may be detonated and disruptives exploded, and this is how cotton can be used in both capacities.

However, gun-cotton or nitro-cellulose is only employed as a disruptives for demolitions in the field, and for the charges in war heads of torpedoes and submarines mines. Thus its use in this respect is very limited and doubtless could be replaced. In war by far the greater percentage of high explosives used by a country are those placed in shell and bombs, and for filling the same all countries use substances such as lyddite, trinitrotoluol, melinite, etc. which are made from the nitration of coal tar derivatives.

But cotton as a propellant appears to be an absolute necessity, for it is used in different forms under various names by all European Governments. It is in this respect, as a propellant not a disruptive, as a "low explosive" not a "high explosive" that cellulose in the form of cotton if it be unobtainable, would seriously impair the fighting efficiency of an army.

The propellant used in the British Service made from cotton is known as Cordite and was invented by Sir Frederick Abel and

Professor Dewar in 1889. It consists of gun-cotton, nitro-glycerine and mineral jelly. The French use "Poudre B" composed of soluble and insoluble nitro-cottons with a certain percentage of diphenylamine. Germany uses a mixture of nitro-cellulose, nitroglycerine, mineral jelly and diphenylamine. The Russian and Italian powders have also a more or less similar composition.

From the above it will be seen that every country uses cotton in a nitrated state as a constituent of its propellant for military purposes and therefore the tracing of its life history in this respect would be similar in all of them.

The story told here is one method of treating cotton so as to make it into Cordite. Although the finished article must have similar specifications and pass the same tests, from whichever manufacturer it is received, yet it can be understood that there are several processes, the details of which vary somewhat. All reference to figures, etc. will be omitted since they are of no interest to the average reader, also at the present time it is not to the public interest to divulge them.

Cotton in the form of cotton waste, is used for the manufacture of smokeless powders, and arrives in this country in bales. America, India and China all supply us, the appearance of the waste and the size of the bales differing somewhat in each case. Before this cellulose can be nitrated it must first of all be purified. This is effected by the contractor before it reaches the factory. The purification consists firstly of boiling the waste with benzol or caustic soda to remove any oil or fatty matter still clinging to it, secondly, of bleaching with bleaching powder to remove other impurities, especially colouring matter, thirdly of treating with weak acid and being thoroughly scoured.

It is then known as purified cotton waste, and on arrival at the factory is picked over by women or small boys, to remove all obvious foreign matter such as pieces of wood, string, wire, etc.

After the operation of "picking it over" is finished, it is placed in a teasing machine. This machine consists of several rollers armed with short iron teeth, set very close together. As the cotton passes between these rollers, its fibre is separated and shredded and all knots and lumps are opened out.

On emerging from this machine, it falls on to an endless band by means of which it is carried backwards and forwards for about 35 minutes through a patent dryer. After drying, the amount of moisture in the cotton should be reduced to under 1 per cent.

After this thorough drying the charge of cotton is correctly weighed out and placed in iron boxes fitted with lids. It is then left to cool. When ready these iron boxes are taken to the nitrating house, where their contents are immersed in a mixture of sulphuric acid, nitric acid and water. By this means the cotton is nitrated, i.e. turned into nitro-cellulose. The operation takes about  $2\frac{1}{2}$  hours after which the mixed acids are displaced by water in the nitrating pan, so that the unpurified gun-cotton may receive its first wash.

The washing of this nitro-cotton is one of the most important steps in the process, and is carried out in a vat-house. Here it receives seven boilings of various lengths, with a cold water bath



before and between each boiling. It is altogether some 87 hours in the vat.

From the vat-house it is transferred to a pulping or beating machine, which consists of an elliptical tank fitted with a revolving drum covered with knife edges. On the bed-plate underneath is another set of knives. It is a similar apparatus to that used for pulping rags in the paper-making process. In this instrument the gun-cotton and water are churned round for about  $1\frac{1}{4}$  hours, by which time the former is ground down into a finely divided state. From the bottom of the beater a pipe leads down to an inclined gutter, and when sufficiently pulped the contents of the beater flow down this conduit into the gutter. Here the stream first passes over an electro-magnet to remove any particles of iron or steel, secondly over a grit trap composed of a blanket, and thirdly through a wood catcher to remove any stray chips of wood.

The pulp then flows into a "poacher". This machine at first sight is similar to a beater, the difference is however that a simple revolving paddle replaces the keen-edged drum. Here caustic soda and lime are added in small quantities to give the required degree of alkalinity for the specification, afterwards the paddle is set going and the pulp is given 3 separate washings, taking some 90 minutes in all.

The washed pulp is now drawn up with water by a vacuum pump into a stuff-chest which is merely a large cylindrical or hexagonal iron tank in which are revolving paddles to keep the water and gun-cotton well-mixed. From the stuff-chest run pipes to the moulding machines. By means of small gauge tanks any required amount of gun-cotton can be run-off into the moulds. The plungers of the moulding machine are hollow and covered with fine gauze through which a large proportion of water is sucked off by a vacuum pump. A slight moulding pressure is then applied, just sufficient to expel a certain amount of the residual water and to enable the resulting mass of pulp to be handled with care without breaking.

The moulded cylinders still containing about 40% of water are then removed to a gun-cotton stove, and packed therein on trays having copper wire bottoms. Into the stove is pumped, by means of a circular fan, heated air which enters at various points a few inches above the floor level, the only outlet being two small wire gauze windows. The gun-cotton is in this manner dried at a suitable temperature, the operation lasting about 4 days. At the end of this time it has less than 1% of moisture in it and is easily powdered.

When dried it is taken to the weighing houses, where the requisite quantity is weighed out and placed in bags. These bags are then removed to a mixing house when the proper amount of nitroglycerine for that weight of gun-cotton is run into it. The mass is then roughly mixed by hand on a leaden trough, and rubbed through a leather sieve into another bag. In this condition it is known as "paste."

The paste is then removed to the incorporating houses and placed in incorporators. The essentials of this machine are two revolving shafts each fitted with four fins. Each shaft is in a close

htting bed and revolves inwardly, one moving twice as fast as the other. By this means the paste is thoroughly mixed. When the machine is filled a certain amount of solvent is run in. This solvent which is inactive chemically, dissolves the paste giving it a colloidal jelly-like structure, on which depends the power of regulating the resultant rate of burning. Half way through the incorporation the machine is stopped and the correct proportion of mineral jelly is added, the machine is then started again. Arrangements are made to cool the incorporators during action, so that the temperature will not rise above a fixed safety maximum. After six or seven hours the machines are stopped and unloaded. Their contents, now known as "dough," are loaded into bags and sent to the press-house.

In the press-houses there are various sorts of presses for different types of cordite, but the main principle is the same. A steel cylinder is filled with dough and closed by means of 2 muslin discs, a copper sieve and a zinc supporting plate underneath which is screwed in the die-plate having holes of varying diameter for the different sizes of cordite. It can be understood that the diameter of cordite sticks must differ owing to the numerous natures of guns for which it is used as the propellant. The muslin and copper sieve are to prevent any solid impurity if there still be any, from appearing in the final sticks.

The steel cylinder is then placed in the press and subjected to hydraulic or screw pressure. This forces the cordite dough out through the die at the bottom in the form of long cords, from which this propellant takes its name.

These cords are then cut to the required length for making up their particular cartridges, and are placed on wooden trays. These trays are then taken to the cordite tray stoves.

Here they are stoved for varying periods up to about five weeks depending on the size of the sticks. At first the solvent used in the incorporators is driven off, collected and recovered, then the remainder of the time the cordite is merely getting thoroughly hardened and dried.

In its finished state it is in the form of hard, dark brown, semi-transparent cords, and no eye, however keen, could detect the original white fluffy cotton, so great is the metamorphosis.

Just as the original gun-cotton was blended through all its different processes by mixing the contents of several vats into various beaters, and beaten into different poachers, so now the cordite is blended to secure uniformity in its ballistical effects.

The trays from the cordite stoves are laid out in rows in the blending houses, and men pick a handful of sticks from each tray and mix them in boxes. These form a blend. Then so many blends, varying on the size of the cordite form a lot.

The lot is then packed in boxes and given a distinguishing number for reference purposes. Cartridges made up from the same lot of cordite should give the same results in shooting.

The manufacture of cordite in bulk is now finished, and in its boxes, it leaves the factory. There is, however, a certain amount yet to be done before it can take its place efficiently in the firing-line.

On leaving the factory, cordite in bulk proceeds to the Arsenal where it is handed over to the Inspection Staff. Here it is tested and proved. That means to say that it must pass certain standards laid down, and must be up to the specification. It is proved and fired and its ballistical results noted. If it is satisfactory it is passed to the Royal Laboratory for the manufacture of cartridges.

Up to the present the life-history has been the same, but now the paths diverge. Different cartridges go separate ways and although eventually all are destined for the Firing-Line be it over sea or land, yet the stately 15" B.L. cartridge weighing well over 2 cwt. does not pursue the same course as its humbler brother, the '303 small arm round of ammunition.

To this end, some special cartridge must be taken, so let us choose a heavy battery gun cartridge say a 60-pr.

In the Royal Laboratory the correct weight of the requisite size of cordite for that gun is taken, and the sticks bound together and placed inside a cartridge case of silk cloth. This is sewn up and has an igniter of gun-powder at each end to facilitate the lighting of the charge. Stencilled on the cloth is all the information of that cartridge. These cartridges are then packed into boxes and handed over to the Army Ordnance Department for issue.

As required they are packed on ships and conveyed over to the Ammunition Base abroad, where they are unloaded and stored under the orders of the Chief Ordnance Officer at that port, who arranges for their dispatch to the Ammunition Rail-head. They are off-loaded from the train under the direction of the Ordnance Officer rail-head under whose custody they remain until they are fetched by the motor lorries of the Army Artillery Park.

They remain in the Park till required by a certain Heavy Brigade. Then they are transferred by the Park lorries to the Brigade Ammunition Column. In turn they are sent up by that Brigade Ammunition Column to the 1st Line of one of its batteries. Any particular cartridge may remain in the 1st Line a day or a week, or even a month, but one day it is called for and sent up to the guns.

On arrival at the battery position it is stored in an ammunition pit or under some convenient cover near the guns. At last it is fired, and then bang. In the twinkling of an eye it has disappeared, disintegrated into various gases, by whose means a shell has been propelled towards the enemy's lines. If it is effective, all well and good, but if not, if it fail to hit its objective, the waste of energy and labour, cannot but stare us in the face. Before the cotton could expel the projectile from the gun, it had to undergo some twenty operations, and pass through numerous hands. The shortest possible time which could elapse before the cotton reached the battery, even if all operations succeeded one another without cessation, which is impossible, would be about 8 weeks.

However, we hope that the shells will not fail to reach their target, and that in this war the last letter of an old Gunner alphabet will prove amiss.

"Z stands for zero which tells without flattery

The number of shrapnel effective per battery."

## THE PURSUIT AFTER THE GREAT BATTLE IN LORRAINE, August, 1914.

Abridged translation from Art. Monatshefte.

BY BRIG.-GENERAL H. A. BETHELL.

---

(The writer of this article, Major Seeger, commanded the Horse Artillery Abteilung, three batteries of 4 guns, of the 15th Prussian regiment of field artillery).

AT the outset of the war, the French made a dash into Lorraine, driving the Germans back to the Saar. We, the Germans, brought up strong reinforcements, and fought a great battle, culminating on the 20th August 1914, in which we completely defeated the French invaders.

Early on the morning of the 21st my Abteilung was at Insweiler, when orders came from the VI Army at Helimer to pursue the enemy. Our cavalry division trotted off in three columns, and we accompanied them. We saw no signs of the supposed disorderly retreat of the French, and there were few abandoned wagons and discarded weapons. At Maizieres our advanced squadron reported that the enemy were holding the canal at Moussey, and that his long columns were toiling up the hill to Avricourt. I galloped to the divisional commander, and asked leave to put in my batteries; I was ordered to advance at once to a position North of Moussey, and open fire on this, presumably, excellent target.

I ought to have had a screen of skirmishers, especially in front of my No. 2 battery, as a dashing charge of the French cavalry might easily have cut us off. But our own cavalry, who had dismounted to attack Porte St. Marie, still held by the enemy, were new to the job, and advanced on foot very slowly, so, as time pressed, I had to get on alone. Fortunately the French cavalry were not of the same quality as their excellent artillery, and did not molest us.

Now the difficulty was to get hold of my three batteries, one of which had accompanied the advanced guard, and was visible filing slowly (much too slowly for me) along the edge of the wood, while No. 2 battery was already advancing into position. I thought, and still think, that in similar circumstances the artillery commander should be well to the front, say with the main guard of the advanced guard, in order that he should get his information early and bring his batteries into action without delay. When I galloped forward a glance over the crest showed me that there was no time to lose: I

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could see the dense columns of the enemy, already some 5500 yards distant, climbing the Avricourt hill to Igney.

I turned round to give orders to my staff, and, to my disgust, found myself alone! My adjutant had been sent away, and my staff had failed to get past the cavalry in the narrow road. Luckily a cavalry officer turned up, who had been sent after me with orders. I sent him back to clear the cavalry off the road and to send my two batteries along.

Now I had a choice of positions; either just East of the Maizieres—Moussey road, or 500 metres further to the front, at about the same level. Fortunately for us I chose the latter, in order to get away from the road which emerged from the wood behind us. I rode along the position quickly, then tied up my horse to a hayrick and reconnoitred more closely on foot, while I impatiently awaited by battery commanders. At last they arrived, and with them part of my staff, so that I could now point out my O.P. and have my "scissors" telescope set up.

Our preparations can hardly have escaped the watchful eyes of the French gunners, for, as we soon had occasion to know, they had already got several batteries in action to protect their retreating columns of infantry, who were in a very dangerous situation.

Fifteen minutes later my batteries came up. To the one which arrived first I had already assigned the French columns on the road to Igney, which it was urgently necessary to engage before they disappeared over the hill. Unfortunately, in the hard ground, it took time to dig in the spades so as to get the elevation for the range, which was over 6000 yards. How often do we find cause to regret the small range of elevation which our carriage gives on level ground, which obliges us to dig before we can open fire!\*

In the mean time I was searching the landscape with my scissors telescope for other targets, when I noticed in the direction, as I supposed, of Rixingen, a "black snake" creeping towards us and then stopping. It was about 4400 yards distant, on a flat spur somewhat below us. A good look through the glass showed that it was a battery, with the drivers dismounted and leading their horses, creeping along below the crest, and fast about to come into action to a flank. Friend or foe, I could not be certain. My heart thumped with excitement. If it was a French battery, then it was coming into action, with its flank to us, unsuspecting of our presence; we could plaster it with fire, and our numerous cavalry could capture the remains! But for all my staring through the glass I could not be certain whether the men were Bavarians from the corps adjoining us, many of whom still wore their light-blue uniform, or Frenchmen. By their procedure, and the colour of their uniform, they could not possibly be Prussians. Now came the critical moment; the column halted and unlimbered; if they pointed their muzzles North they

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\* The German horse artillery gun, which is the same as the 7.7 <sup>mm</sup> field gun, is capable of 16 degrees elevation. It does not seem to have occurred to the German commander to fire off his guns with the maximum elevation attainable, in order to bury the spades.—Transiator.

must be the enemy, while if South they might be one of our Reserve batteries which had joined in the pursuit.

The guns came into action, and I distinctly saw the long muzzles of French field guns as they swung round to the North! I had not been mistaken; they were the enemy, and they were about to fire on our column, the one next on our right. To make certain, I counted the carriages; five dark objects remained, while the rest of the battery, with the horses and limbers, trotted off to cover, according to method "F" of the French drill book. There were the four guns, the wagon body left for the battery commander to observe from, and, yes, I could make out a dot behind the centre of the battery which must be the sixth wagon body, according to the well-known diagram of a French battery in action.

My adjutant and the commander of No. 3 battery, who was beside me, still had their doubts, and begged me to wait and make certain. (I admit that in doubtful cases it is best to wait). But I stuck to my opinion, and gave the order with decision: "Engage the battery. I am responsible." I divided this tempting morsel, the battery with its flank to us, between No. 1 and No. 3 batteries, and I gave them as auxiliary mark a steeple right behind the French battery, which I took to be that of Rixingen, but which turned out afterwards to be that of German Avricourt. I mention this because it is of the highest importance to correctly identify all landmarks during the reconnaissance of the position; mistakes in this respect, which are easily made in the enemy's country, may lead to disastrous results.

I ordered No. 1 battery to engage the target with searching fire at successive elevations, in order to obtain some effect at once, while No. 3 bracketed with H.E., taking advantage of the fire of No. 1 to assist their observation. The former order was not in strict accordance with the drill book, as the target could hardly be considered a "fleeing" one. But which of our German commanders could adhere painfully to the letter of the drill book, when it is a question of producing immediate effect? Our regulations were intended for very different tactical conditions, and we have had to learn our work afresh under the pressure of service conditions.

Well, the simultaneous searching and bracketing gave good results at once, as I could clearly see with the telescope. The French battery was visibly taken by surprise by the sudden enfilade fire. First the limbers, which were standing not far behind the battery, trotted off, to escape from the zone of fire. I ought to have assigned the limbers to one of my batteries as a target; but it is easy to be wise after the event. Then, at the guns, I saw some of the detachments make a bolt for it into a hollow behind the battery, which was moreover screened from us by high standing corn. Only one gun, with a No. 1 or section commander more energetic than the rest, dared the unequal combat and swung its muzzle round in our direction. Perhaps it was not yet anchored; for, to my surprise, they picked us up and fired the first round in less than 30 seconds. We had often heard of this defect of the French gun, the difficulty of getting on

to a fresh target when anchored. Our flashes must have been clearly visible to the French, as we were not far behind the crest, and almost all my guns were firing at once. Moreover the smoke of our guns, which is especially visible on a damp day, gave us away sooner than I cared for. This is another reason why we now have to keep further behind the crest than the "barely-concealed" position which we used to be so fond of. But, however this might be, I could not help admiring the smartness with which our adversaries got on to us. Perhaps they were assisted by the rangefinder, which we did not then possess.

We saw the long flash spout from the muzzle of the French gun, and heard the shell coming. It pitched not twenty paces in front of us, and burst with a mighty bang. "Donnerwetter, good shot!" I shouted involuntarily. I ordered gun fire, at an accelerated rate, and before long the single gun opposed to us ceased fire and the detachment withdrew. Now I ordered percussion fire with H.E. to demolish the guns, while the other battery searched the ground behind them with shrapnel to keep their men away from the guns; and in this, for the time being, it was successful. The battery seemed abandoned, so I asked leave of my divisional commander, who was close by at Porte St. Marie, to carry off the guns with my own men. I told my adjutant to take 20 men (whose horses had come up in the mean time), to ride by the shortest way to the abandoned battery, some 4400 yards distant, and to take possession of the guns. But we had underrated our adversaries. My adjutant only got as far as Avricourt, where his party came under heavy rifle fire, so that after trying various ways round he had to come back empty-handed.

While my batteries kept up a steady fire on the abandoned battery, our French comrades were not idle. They set to work to save their guns, and I am bound to say that they set about it in masterly fashion. It was a regular academical example of one unit helping another in retreat. They told off two batteries to smother us with fire, in order to silence us while the original battery withdrew its guns and disappeared as quickly as possible.

And now began the second phase of this combat, which we found less agreeable than the first. As I kept my glasses on the French battery, I noticed that the four little dark objects marking the position of the guns were gradually dwindling. Then I saw one gun walking off by itself! Sheltered by the high corn, the French gunners had crept up to their guns, fixed drag-ropes or wires to them, and were slowly dragging them over the crest. A confoundedly smart notion! I had to accelerate our fire at once, in order to keep our grip of the disabled battery. But while our shrapnel and H.E. were falling thick about the guns, our adversaries got busy. Two or more of their batteries opened fire on us, from positions which we could not locate either then or afterwards. We were utterly unable to reply to them. Suddenly a *rafale* of extraordinary violence was let loose on my O.P. and on the batteries, which were not far behind me. Shells came in from right and left. The fire astonished me not only by its suddenness but by its precision.

Fortunately for us, however, the enemy had taken the range, not to our spur, but to the hill behind us. Therefore his shells, though well aimed, mostly fell behind us, so that we got comparatively few hits in the line of guns. Their first "group" fell 300 metres behind us, one shot alongside another, in a line that might have been drawn with a ruler; they were exactly at normal gun-intervals, showing that the guns were accurately layed parallel. The other French battery had got the range too short, and the shells were falling close in front of my No. 3 battery, seriously interfering with its fire, as the shower of earth and splinters constantly flying up in front of the O.P. rendered it at times impossible to observe. This checked our fire on the disabled battery.

I have already referred to the road which emerged from the wood behind us. At this time this was full of our own cavalry, who had come up by it and were in the wood in rear of us, in dense formation. Whole regiments were dismounted on the road and in the wood. They would have done better to clear out, to right and left as soon as we opened fire. As it was, they suffered severely. The second and third salvoes of the enemy's *tir progressif* went right into the wood and into the cavalry columns, causing many casualties.

During this artillery combat, the French continued, with great courage and tenacity, their attempt to remove the disabled battery. At a moment when their fire was particularly intense, we saw a limber gallop up and try to carry off a gun. But a shot killed or wounded a couple of the horses and brought it to a standstill. Soon afterwards the French seemed to have abandoned the attempt; but we made out with the telescope that all the guns had disappeared, and that only the wagon bodies remained. So they had saved their guns after all!

This combat had kept two of my batteries engaged for about two hours. In the mean time I had ordered my left battery to advance to a position on the Rhine-Marne canal, from whence they could better command the low ground at Moussey. They failed, however, to get forward, in consequence of the enemy's heavy fire on Porte St. Marie. Our divisional staff had found it too hot for them there, and had cleared out, without taking the trouble to inform me.

Throughout the afternoon our cavalry failed to get across the canal, except in small detachments, so that the French were able to continue their retreat comparatively unmolested. Also the squadron told off as my escort, and posted on my left, came under the enemy's artillery fire and retired to a safer position, so that several times I had to intervene personally in order to maintain the absolutely necessary protection of our exposed flank. Artillery in action have an absolute right to demand protection from the other arms, and these must not withdraw an escort, once posted, without urgent necessity, such as did not exist in this case. In plain words, they must not run away and leave the guns in the lurch. We were all glad when a company of infantry came up as our escort. But even these had to retire into the wood towards evening, when a violent burst of fire forced us to crouch behind our gun-shields.



The task assigned to the French batteries was, at all costs, to prevent the masses of our cavalry from crossing the canal in pursuit, and this they achieved to perfection. We did not succeed in cutting off a single detachment of the French rear-guard. This action shows, better than any academical example, the immense value of our weapon in covering a retreat. It was a day on which we all learnt much, especially from our enemies.

Night fell. The Abteilung had held out all day, almost alone and practically without protection from the other arms. As the last rays of the setting sun touched the tree-tops, we buried our dead on the position, and sent our wounded men and damaged material to the rear.



## AN EXAMINATION OF "THE TRAVELS OF MASTER-GUNNER EDWARD WEBBE."

Sometime Chief Master-Gunner of the French Army in the Field.

BY LIEUT.-COLONEL H. W. L. HIME.

[The references are to Arber's large paper reprint of the Travels].

**I**N 1869 Mr. Arber reprinted in good faith the "Travels of Master Gunner Webbe," with an enthusiastic encomium on his modesty and courage. I should be glad could I join in these praises, but a study of the small book has convinced me that the Travels are fictitious and are akin to the "Travels of Sir John Mandeville" and "Memoirs of Captain Carleton."

Edward Webbe, we are told, was born in 1554, the son of Richard Webbe who (we know for certain) was Master Gunner of England in that year. In 1566 Edward went to Russia as page to Captain Anthony Jenkinson, the English Ambassador; and he was in Moscow when the city was burnt by the Tatars in 1571. He escaped from the flames only to fall into the hands of the Tatars, who carried him off to Kaffa in the Crimea where he remained a prisoner until ransomed in 1576, a period of 5 years (p. 18).

In 1582, while returning to England from Alexandria by sea, he was taken by the Turks and brought prisoner to Constantinople. With the Turks he remained (according to his story) until ransomed in 1588, a period of 6 years as he says twice (p. 20).

When passing through Italy on his way to England after his release, he was imprisoned for 7 months as a spy by the Spaniards in Naples; and after enduring great cruelties (by his own account) was liberated in order to serve as a gunner in the service of the King of Spain.

It is clear that the sum total of his periods of servitude were eleven years and seven months, yet on p. 29 he tells us he was 13 years with the Turks.

At the Court of Prester John (he says) he saw a beast "having 4 heads, in shape like a wild cat"; and at the same Court there were a number of unicorns "so tame that I have played with them as one would play with young lambs" (p. 25). He states that he served in the "Royal" under Don John at the taking of Tunis (p. 35). Don John certainly took Tunis; but he did so in October, 1573, and during that year (by his own account) Webbe was in Kaffa. Again he tells us (p. 32) how pleased he was to see an Englishman, the Earl of Oxford, defeat all comers at a tournament in Palermo. It is true

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that Edward de Vere, 17th Earl of Oxford, once travelled in Italy; but he was there in 1575, whilst Webbe was still at Kaffa. This Earl, it may be remarked, had greatly distinguished himself when tilting in 1571 in the presence of Queen Elizabeth. Webbe tells us, p. 19, that on his way home from Alexandria the "Henry," in which he sailed, was surrounded by 50 Turkish gallies, "with which gallies we fought for two days and two nights," and it was only after 50 men, out of a crew of 60, had been killed that they struck their colours. The fame of the "Revenge" pales before the fame of the "Henry." The "Revenge" with a crew of 150 naval sailors fought 15 Spanish ships for 15 hours: the "Henry" with a crew of 60 merchant sailors fought 50 Turkish ships for 48 hours. Dominie Sampson would have shouted "prodigious!" at this exploit, but Mr. Burchell's "fudge!" would be more appropriate.

In his Dedication to Queen Elizabeth Webbe recalls the humble thanks he offered up to Heaven for saving his Queen and country from the hands of the Spainards,—when "to my great comfort, in the midst of my thralldom in Turkey, I did hear it most truly reported by a Christian Captive." But presently he forgets all about the Christian Captive and declares, p. 32, it was on his homeward journey through Italy—"which was at such time as the Spaniards came to invade England, after I had been released of my imprisonment"—that he heard of the dispatch of the Armada. "I said I trusted God would defend my Prince better than to deliver her into the hands of her enemies; wherefore they did greatly revile me."

We now reach the culminating point of Webbe's career. In November, 1589, (he says) he went to France—"where I had good entertainment at the hands of the Renowned King and Captain of this age, Henry of Burbon, King of France and Navarre, who received me into his pay and appointed me for Chief Master Gunner in the field." An Englishman might have easily joined the force of 4000 men which Lord Willoughby d'Eresby led into France to help Henry IV in the middle of 1589; but as the English Government would not, and Henry IV could not feed, clothe and pay these unhappy men, Lord Willoughby brought back the remnant of his force to England on the 14th Jan. 1590, exactly two months before the battle of Ivry. Lord Willoughby had previously reported to the Privy Council that "more men died of hunger and cold than in battle."

Master Gunners in the 16th century were artisans whose speech was strongly larded, like the speech of artisans everywhere and always, with the technical words and phrases of their art or trade. Who, then, will believe that a Master Gunner wrote these Travels in which technical words are conspicuous by their absence? We look in vain for such words as *gun*, *piece*, *powder*, *carriage*, *lint-stock*, &c. &c.; or for some passing allusions to Turkish or French guns or gunners with whom he served. The only words he uses, which are in any way connected with Artillery, are *charge* (once), *shooting* (once) and *shot* (twice),—three words quite as well known and commonly used by civilians as by gunners.

The Artillery played a notable part in the battle of Ivry<sup>1</sup>; yet

<sup>1</sup> Sully's "Memoirs"; I, 225; Bohn's Library.

the Chief Master Gunner, who devotes whole paragraphs to his sufferings, to tournaments and to unicorns, and who can even find space for unworthy sneers at the monks of the Church of the Holy Sepulchre (p. 27), confines himself to two short and trivial remarks about the battle. He says, "we were constrained to make bulworks of the dead bodies of our enemies and of the carcasses of horses" (p. 34),—a proceeding unknown to the historians I have consulted. Secondly, he says "I gave 3 charges upon the enemy, and they in steede thereof gave us 15." Both De Thou and Parma Cayet say that Henry's guns fired 9 (not 3) times before the Duke de Mayenne's guns replied; and so far were the guns of the League from firing more rapidly than the King's, that Sully says Henry's guns fired four shots to one. During the battle the King's guns were attacked by a mass of the enemy, and according to some accounts were actually in his hands for a short time; but not a hint of this is given by the Chief Master Gunner.

The statement that Henry IV appointed a wandering Englishman as Chief Master Gunner over the heads of his own gunners, at a moment when he needed the support of every Frenchman so urgently, would require very strong corroboration, and I am not aware of any whatever. Appointments in the French Artillery were much sought after at this period,<sup>1</sup> and no soldiers are more sensitive about supersession than the French. If, therefore, Webbe had been appointed Chief Master Gunner, there would to a certainty have been an outbreak of protests, some traces of which would have come down to us in contemporary documents. But the presence of an Englishman among the French gunners, the very existence of Webbe, was (so far as I am aware) totally unknown to all the French officers who served at Ivry, or who wrote about the battle afterwards. The only mention of Webbe I have seen is that in the "*Discours de la Bataille de Garennes (Ivry)*" by Charles, Duc de Mayenne, reprinted in the "*Bibliothèque des Bibliophiles*," 1875, with an excellent introduction in which the editor says:—"s'il faut croire un rare et singulier petit écrit qui nous inspire peu de confiance, le maître canonnier aurait été un Anglais, nommé Edward Webbe." The "rare and singular little book" was Arber's reprint of the "Travels," from which the French first learned in 1869 of Webbe's existence.

It is unnecessary to follow Webbe into the Indian Ocean where he alludes to some protracted siege of Goa (apparently that by Ali Adil Shah II of Bijapur) and to an imaginary capture of Hormuz by the Turks; for it must be already evident that the assertions of the author of this book (whoever he may have been) are utterly untrustworthy, and that the book is as pure a fiction as the "*Travels of Sir John Mandeville*" and the "*Memoirs of Captain Carleton*." It is very far from being so artistic a fraud as the latter a book which deceived Lord Macaulay as to render much of his "*Essay on the War of Succession in Spain*" quite misleading. The truth was not discovered until Colonel Hon. H. Parnell, R.E. proved in the "*English Historical*

<sup>1</sup> Favé, "*Hist. et Tactique des Trois Armes*," 1845; p. 59.



Review," Jan. 1891, that the book was simply an artful romance, probably by Swift. Webbe is also much less artistic than Sir John Mandeville, whose book had been "a household word in eleven languages and for five centuries before it was ascertained that Sir John Mandeville never lived and that his travels never took place."<sup>1</sup> Our Master Gunner himself has run a successful career for three centuries and a quarter.

The success of Webbe's book, of which the 1st edition, a reprint of the 1st ed., and a 2nd (and *corrected*) edition all appeared in 1590, was due beyond doubt to the skilful advantage taken by its unknown author of the anti-Spanish and anti-Roman feeling which was at fever heat in the period 1588-90. Mandeville (with whose work Webbe was intimately acquainted) was promised the hand of an Egyptian Princess in marriage if he would forswear Christianity. The Master Gunner could not aspire so high; but the Turks, he tells us, "by all means possible would persuade me . . . to believe in their God, Mahomed: which if I had done I might have had wonderful preferment of the Turk, and have lived in as great felicity as any Lord in that country: but I utterly denied their request, though by them grievously beaten naked . . . and reviled in most detestable sort" (p. 29). This was no unskilful bid for popularity at a time when "Mahound" and his followers were in extremely bad odour. On his way home he met at Padua an English friar—"who brought me before the high Bishop where I was accused for an heretic; but when the friar's two witnesses were found forsworn men, then I was set at liberty and constrained to give 15 crowns towards the finishing Our Lady's shrine at Padua" (p. 30). At Rome "I was nineteen days in trouble with the Pope and the English Cardinal Doctor Allen, a notable Arch-papist"; but on learning that he had been long a captive of the unspeakable Turk, they gave him 25 crowns and dismissed him. He only escaped from their hands to fall into the clutches of the English College (at Rome, founded by Allen), and by these miscreants he was despitely used:—"I was put into the holy house 3 days, with a fool's coat on my back, half blew, half yellow, and a cockscomb with 3 bells on my head." From them he was released, through the agency of an Englishman, by the Pope. On reaching Naples he was captured as a spy by the Spaniards and imprisoned for 7 months. Among other punishments, "I was hoisted up backwards with my hands bound behind me, which strook all the joints in my arms out of joint" (p. 31). Ultimately, the King of Spain ordered "that I should be employed in a gunner's room," and he was engaged on 35 crown's pay a month as a gunner, disjointed arms and all.

The English public of 1590 were so thrilled with delight at the courage and constancy of the devout and orthodox Master Gunner under the sufferings inflicted on him by unbelieving Turks and misbelieving English traitors and Spaniards, that no one bethought himself to ask the simple question—are these things true? The equally simple answer would have been—no. Webbe's travels are as fictitious as Gulliver's and Robinson Crusoe's.

<sup>1</sup> "Cambridge Hist. of English Literature," II, 78.

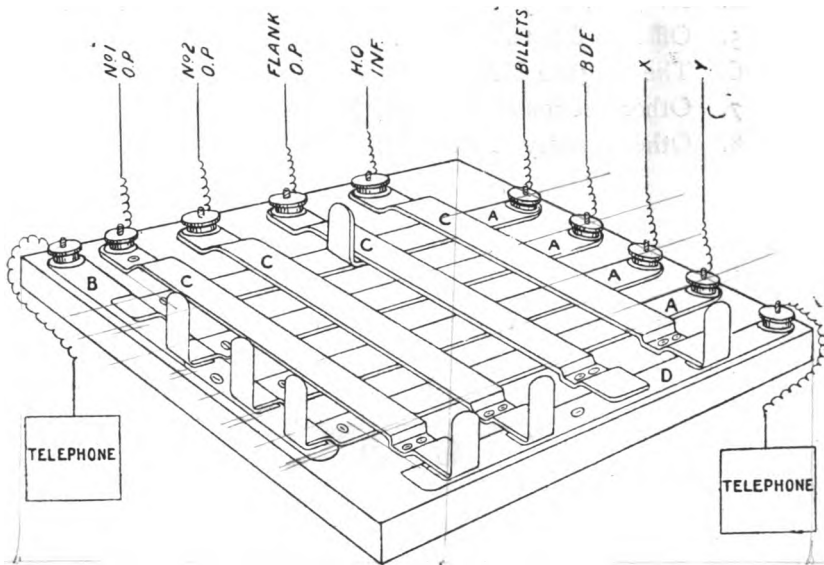
## AN IMPROVISED TELEPHONE EXCHANGE.

BY LIEUT. <sup>P. J.</sup> W. P. K. WARREN, R.G.A.

**T**HIS type of improvised exchange has been used in the battery and has been found to work very well. It is made quite easily from very simple materials which can be obtained always.

It is an eight-line exchange and two telephones are used.

The scheme of working is as follows:



Referring to diagram, strips of thin brass A are screwed to the base block and have their ends bent up to clear strip B. Strips C are also screwed to the block and are bent to clear strips A and also strip D.

Contact between the various strips can be made by inserting a plug, of bent brass, at any of the points where the strips cross.

Normally plugs are kept in all along bars B and D and calls from the various stations are received in one or other of the telephones.

Diagram shows the arrangement of plugs when Billets is speaking flank O.P.

They get no interference from other lines and the battery exchange can tell when they have finished by putting in his plug to telephone now and again.

When shooting is in progress and a clear line from a battery telephone to an O.P. is needed, the other three lines are transferred to the other telephone by moving their plugs up one place.

Thus no line is, even temporarily, cut off.

The brass is cut from an 18-pr. cartridge case.

The terminals come from worn out telephone cells.

The base is 8 inches square and 1 inch thick and should be well soaked in melted candle grease.

The two terminals X and Y are used for the other section of the battery and the other battery of the brigade.

The lines on the exchange are :—

1. No. 1 Observation Post. No. 1. O.P.
2. No. 2 Observation Post. No. 2. O.P.
3. Flank Observation Post. Flank O.P.
4. H.Q. Infantry Battalion in the trenches. H.Q. Inf.
5. Officers Billets. Billets.
6. The Brigade H.Q. Bde.
7. Other Section of Battery. X.
8. Other Battery of Brigade. Y.



## CORRECTING LINE OF FIRE WHEN SITUATED IN AN O.P.

BY MAJOR F. H. METCALFE, R.G.A.

I have found so many officers who find difficulty in correcting fire when situated in an O.P. which is to a flank of their battery line and especially on a target with a narrow front that I venture to submit the following method:—

$\alpha$  = Apex angle.

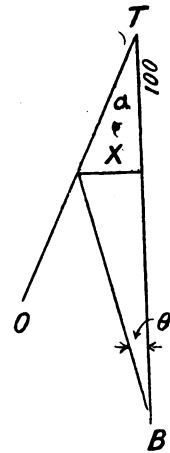
$\theta$  = Deflection required for 100 yards alteration of elevation to keep shell on observers line.

B.T. = Battery range.

$$\frac{x}{100} = \tan \alpha$$

$$x = 100 \tan \alpha$$

$$\tan \theta = \frac{x}{\text{B.T.} - 100} = \frac{100 \tan \alpha}{\text{B.T.} - 100}$$



The above can be worked out by a table of natural Tans. Below is the result. Showing values of  $\theta$  for various ranges and apex angles.

Apex Ang.	10°	15°	20°	25°	30°	35°	40°	45°
2000	30'	50'	65'	85'	95'	125'	150'	180'
2500	20'	40'	50'	70'	80'	105'	125'	150'
3000	20'	30'	40'	55'	70'	85'	100'	120'
3500	15'	25'	35'	50'	60'	75'	90'	100'
4000	15'	25'	30'	40'	50'	65'	75'	80'
4500	10'	20'	25'	35'	45'	60'	70'	75'
5000	10'	20'	25'	30'	40'	50'	60'	70'
5500	10'	15'	20'	25'	40'	45'	55'	65'
6000	10'	15'	20'	25'	35'	40'	50'	55'
7000	10'	10'	20'	30'	30'	35'	40'	50'

Example:—

Battery range	...	...	...	...	5000
Observers range	...	...	...	...	2500
Apex Angle	...	...	...	...	30°
100 yds. alteration	...	...	...	...	40'

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Observer on left of battery in which case when shortening give left deflection.

Observer can find these out for himself or they can be sent up from the battery map as "usual information."

		Line.	Range.	
1st	Shot	2° L	V.O.	correction 1° more right*
2nd	"	line	short	1°20' more right add 200 yds.
3rd	"	10' L	over	35' more left shorten 100 yds.†
4th	"	10' R	short	15' more right lengthen 50 yds.

I have found that this method is of the greatest value in case of a small target like a house. Of course in the case of a small object it is as well in ranging to keep a little to the windward side.

\* Observers observation reduced to battery range.

† 5' more right for observers observation reduced to battery range, and 40' more left to keep next shell on observers line, equals 35' more left.

With large Apex angles, when shortening, slightly less correction is required. For instance with an Apex angle of 40° and battery range of 5000 yds. if the range is shortened 100 yds. the true correction would be 33' instead of 100'.



## THE DIARY OF THE WAR OF 1914.

By COLONEL F. C. MORGAN, late R.A.

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*(Continued from page 538).*

*December, 17th.*

**WESTERN EUROPE.**—A bombing attack against the British lines about the quarries N. of Loos was easily repulsed. To the N. of Ypres there was unusual artillery activity.

From the French front artillery fighting at many points is reported: and aircraft dropped 20 shells of heavy calibre on the Sablons station at Metz.

**PERSIA.**—A Russian army advancing due South from the Caspian Sea has occupied Hamadan which had been in the hands of Persian rebels and German agents: they are also moving on Kum.

*December, 18th.*

**WESTERN EUROPE.**—The day was misty and unsuitable for artillery and was therefore quieter. A French torpedo boat off Nieuport brought down a German hydroplane taking its occupants prisoners.

*December, 19th.*

**WESTERN EUROPE.**—N.E. of Ypres the enemy discharged gas against our line, accompanied by a heavy bombardment: the protective measures used against gas proved effective. They also blew up 2 mines in front of our trenches E. of Armentieres, but were unsuccessful in attempting to occupy the craters.

Enemy airplanes flew over the region of Poperinghe and threw 10 bombs.

**EASTERN EUROPE.**—In the Riga area, and also N.W. of Dvinsk unimportant actions have taken place, as well as in the neighbourhood of Chartoryisk further South.

**ITALY.**—On the Northern slopes of Monte Nero a surprise attack on the enemy was successful, trenches being captured.

**BALKANS.**—The Anglo-French army inside the Greek frontier now occupies a line from Kilindir to Karasuli. The whole operation of the withdrawal from Serbia lasted 11 days ending on the 12th December.

**MISCELLANEOUS.**—Berlin reports officially that the small cruiser "Bremen" and a torpedo boat accompanying it, have been sunk by a submarine attack in the Baltic.

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*December, 20th.*

**WESTERN EUROPE.**—Opposite the Southern and centre portion of our line the bombardment of portions of the enemies trenches in several places is reported. Ypres and St. Jean were heavily shelled by the enemy, who also made a bomb attack on our trenches N.W. of Hulluch which was repulsed. During the day there were 44 combats in the air: one British machine is reported missing, whilst several hostile ones were brought down.

The communiqué reports considerable artillery activity on the French front. Four bombarding airplanes escorted by seven others armed with machine guns dropped heavy bombs on the goods station at Mülhausen.

Berlin reports the firing of the coast batteries compelled the withdrawal of the hostile monitors that shelled Westende on the 19th.

**GALLIPOLI.**—The whole of the troops at Suvla Bay and Anzac together with their guns and stores have been successfully transferred with insignificant casualties to another sphere of operations. By this contraction of front it is announced that operations at other points of the line will be more effectively carried out. The landing at Suvla Bay took place on August 6th.

**BALKANS.**—In Albania the Greeks and Bulgarians are said to have been in collision.

**MESOPOTAMIA.**—General Townshend reports that the Turks lost 2500 men in the rear guard action of 1st Dec. and in the abortive attack on his position at Kut-el-Amara on the night of 12/13 Dec. On the 17/18th mixed parties of British and Indian troops attacked the Turks in their advanced trenches killing several, the 18th and 19th days passed off quietly.

*December 21st.*

**WESTERN EUROPE.**—On the British front the enemy made two determined attempts to occupy craters opposite Armentières, but were repulsed and lost heavily.

Bad weather hampered operations on the French front: in addition to artillery bombardments at various points, a successful attack after an artillery preparation was made on the Hartmannsweilerkopf in the Vosges.

**EASTERN EUROPE.**—General Ruszky has been relieved of his functions as C.-in-C. of the armies on the Northern front.

On the Galician front the enemy's minor attacks were all repulsed: and in the Dvinsk area Russian airmen successfully bombarded the enemies approaches.

**GALLIPOLI.**—The Prime Minister announced that the withdrawal from Suvla Bay and Anzac was accomplished with the loss of only 3 wounded: six guns were left behind after being destroyed: he stated that the retirement does not involve a similar operation at Cape Helles.

**BALKANS.**—The Russian fleet have bombarded the Bulgarian port of Varna for the 3rd time: the squadron was accompanied by 16 transports with troops for debarkation.

**MISCELLANEOUS.**—The Under Secretary for War states the German losses up to 30th November, 1915, as 484,218 killed and died of wounds, 384,198 severely wounded: the total including missing and died of disease being 2,524,460: the wounded who return to duty are apparently not included.

*December 22nd to 24th.*

**WESTERN EUROPE.**—On the British front there has been artillery activity on both sides, especially about Fricourt, on either side of La Bassée canal and at Ypres. The French captured 1300 prisoners during their attack in the Vosges yesterday; but the enemy regained a footing in a part of the trenches taken.

**ITALY.**—Minor artillery combats and airplane incidents are recorded on the Austro-Italian front.

**BALKANS.**—The Russians bombarded Varna on the 20th in a fog with a powerful squadron but have so far landed no troops.

**PERSIA.**—The Russians have captured Kum; the first stronghold Hamadan fell on the 15th December.

**MESOPOTAMIA.**—Since the return of General Townshend's force to Kut-el-Amara, our casualties including 200 deaths (49 from disease) have amounted to 1127 up to December 18th.

**MISCELLANEOUS.**—General Sir Charles Munro has succeeded General Sir Douglas Haig in command of the 1st Army: Lieut.-General Sir Archibald Murray succeeding General Munro in the Mediterranean. Lieut.-General Sir William Robertson becomes Chief of the Imperial General Staff.

*December, 25th.*

**WESTERN EUROPE.**—There has been no special feature to record on the British front. The French artillery had successes in Champagne the Woevre and in the Vosges. Berlin reports operations restricted by incessant rain.

**EASTERN EUROPE.**—In the Riga region, the Russian artillery have been bombarding the fortified positions in course of construction by the enemy.

**GALLIPOLI.**—The French communiqué reports excellent practice made by their heavy artillery against the Turkish trenches.

**ITALY.**—Violent artillery engagements have occurred in the Tirol, Trentino, and Carnia fronts.

**BALKANS.**—A converging attack on the Allied forces in their positions before Salonika is expected before these are fully developed; the advance however of the enemy's artillery must be slow for want of continuous railway communications.

**MISCELLANEOUS.**—The Prime Minister has announced the total British losses to 9th December, 1915, as 528,227, viz:

Flanders	...	...	...	...	387,988
Dardanelles	...	...	...	...	114,555
Other theatres of war	...	...	...	...	25,684

The number killed were 7,367 officers and 112,556 other ranks.

*December, 27th.*

**WESTERN EUROPE.**—On the British front our artillery bombarded hostile trenches S. of the Lille—Armentières railway, with good effect; elsewhere there was only normal artillery activity.

In Belgium firing against the enemy's positions between the Grande Dune and the sea gave good results.

At many points on the French front there have been artillery bombardments; and in Champagne an infantry attack on the part of the enemy was repulsed.

**BALKANS.**—The Bulgarians have withdrawn some four miles from the Greek frontier between Ghevgeli and Doiran and are fortifying a strong natural position: fine weather has facilitated the work of the allies in strengthening their positions.

**MESOPOTAMIA.**—General Townshend reports that on the night of 23/24th Dec. the enemy fired heavily but had not attacked. They breached a fort on the right side of the British landward position on the North of the Kut peninsula and after effecting an entrance were driven out. On the night of the 24/25th Dec. fierce fighting for the possession of the fort took place: but the garrison consisting of the Oxford Lt. Inf., and 103rd reinforced by the Norfolk Regt. and the 104th Pioneers held on until the enemy on Xmas morning retired to trenches 4 to 900 yards in rear, and Xmas day passed off quietly. The enemy's casualties were about 700, our own 190 killed and wounded.

**MISCELLANEOUS.**—The French liner "*Ville de la Ciotat*", was torpedoed and sunk by a German submarine on the 24th Dec. in the Mediterranean, the survivors being landed at Malta.

*December, 28th.*

**WESTERN EUROPE.**—On the night of 27/28th a mine was exploded near Fricourt, doing considerable damage to the enemy. During the day there was more than usual artillery activity S. of La Bassée Canal, also near Armentières and at Ypres.

In Belgium French artillery blew up an ammunition dépôt near Steenstraate and in Artois the railway station of Lens and the sector of Angres were bombarded: elsewhere on the French front there were artillery engagements.

**EASTERN EUROPE.**—On the Russian front nothing of importance has occurred except in Galicia, and South of the Pripet where severe fighting continues.

**BALKANS.**—The forces opposed to the Allies on the Greek frontier are stated to amount to 150,000 Bulgarians and 100,000 Germans and Austrians; but the French C.-in-Chief Castelnau considers the Salonika defences impregnable.

**EGYPT.**—On the 25th Dec. a Tripolitan force of hostile Arabs 3000 strong were attacked and driven back about 8 miles from Mersa Matru, a railway terminus on the coast about 150 miles W. from Alexandria; the gun fire of the ships supporting. A New Zealand battalion and Sikhs were engaged and their casualties were slight.

*December, 29th.*

WESTERN EUROPE.—The enemy made an attack on 28th on a British aerodrome, no damage was done. A bombing party attacked the enemy's trenches near Armentières with good effect.

In the Vosges the French have had successes and have captured 1668 prisoners during recent engagements.

EASTERN EUROPE.—General Ivanoff's troops in the South have made an attack in force on the Austrians frontier between Bessarabia and Bukowina; the centre of the fighting being at Toporoutz between the Pruth and the Dniester, the results are not yet known.

MESOPOTAMIA.—General Townshend reports the entire cessation of attack or bombardment on Christmas day and a heavy thunderstorm on the night of the 26th.

*December, 30th.*

WESTERN EUROPE.—On the 29th sixteen British airplanes bombed Commes station, and ten machines attacked Hervilly aerodrome doing considerable damage, the aircraft all returning safely: during the day there were twelve encounters with hostile airplanes. The artillery have been active at various places on the front.

On the French front there was nothing very unusual to record.

ITALY.—Rome reports that at 3 a.m. on 29th Dec. an Austrian scout and five destroyers appeared off Durazzo; they bombarded the place but insignificant damage was done; on being attacked by Italian and allied ships two destroyers were sunk, and a hostile airplane was also shot down.

*December, 31st.*

WESTERN EUROPE.—There were active mining operations about the quarries near Loos, five mines being exploded, causing a few casualties, but only slight damage; no infantry hostile attack followed: there was also artillery activity about Hulluch, Givenchy and Armentières.

In Champagne an attempt was made by the enemy to carry a listening post near Hill 193 which completely failed: quiet was reported on the rest of the front.

BALKANS.—On the 30th Dec. three enemy airplanes threw bombs on Salonika: General Sarrail at once ordered the arrest of the Consuls of enemy countries and placed them on board a French warship.

MESOPOTAMIA.—General Townshend reports on 29th Dec. that the village on the right bank of the Tigris opposite Kut held as a detached post, had been subjected to a heavy rifle fire: also that the Xmas fighting casualties were 71 killed (including 3 officers) and 309 wounded.

NAVAL.—The Admiralty report that H.M.S. "*Natal*" (Capt. E. P. Back) armoured cruiser (13,550 tons) sank on the afternoon of 31 December, 1915, as the result of an internal explosion: 300 officers and men out of 704 are reported to have been lost.

## JANUARY, 1916.

*January 1st.*

**WESTERN EUROPE.**—On the night of 31/1st S.E. of Armentières a small party of British troops seized a portion of the German front line, and after inflicting several casualties withdrew: the enemy exploded a mine near the Hohenzollern Redoubt, but failed to do any damage. On the 2nd there were mine explosions on either side and artillery engagements of especial violence N. of Fromelles and E. of Ypres.

Berlin reports the night attack of 31/1st as a failure.

On the French front on the 1st and 2nd the artillery were active, and a German long range gun fired about 10 shells into Nancy and its outskirts, no damage of any military importance however was done, and the gun was silenced.

**EASTERN EUROPE.**—Russia reports on 1st Jan. that no change has occurred on their front from Riga to the Pripet region, but S. of the Pripet, severe fighting continues. The Russians occupy the left or West bank of the R. Styr, the enemy having failed to drive them to the right bank.

On the 2nd on the Strypa front, the enemy have been forced back, and a fierce fight has taken place near Czernowitz. On the Caucasian front our ally's cavalry captured the town of Kop. In Persia the village of Zerret near Hamadan was occupied by the Russians.

**MISCELLANEOUS.**—The P. and O. liner "*Persia*" which left London on 18th December has been torpedoed and sunk in the Eastern Mediterranean, out of 350 on board 158 were saved.

*January 3rd.*

**WESTERN EUROPE.**—Minor incidents only are reported: a successful bombing attack was made by a party of British troops on the Southern portion of the front: also effective artillery action took place on several portions of the enemies line.

The French artillery in Belgium continued its activity, and in other parts of the French front violent bombardments occurred.

**EASTERN EUROPE.**—The main fighting on the Russian front has been in the Czernowitz region, and our ally captured 15 officers, 855 men and some machine guns: the Austrians deny that the line in that area has been broken.

**W. AFRICA.**—The War Office announce the occupation of Yaunde the present capital of Cameroon. So long ago as August 1914 a British force advanced from N. Nigeria and after reducing two towns and the forts of Garcia was forced to retire after a reverse; Garcia was afterwards taken in June 1915.

*January 4th.*

**WESTERN EUROPE.**—On the British front two German howitzer batteries in the Armentières region were silenced, and N.E. of Ypres, enemy's working parties were dispersed. N. of Albert



after hours of preliminary bombardment, the enemy opened heavy rifle fire from the trenches, but a hostile attack was prevented by our fire.

On the French front the only report is of artillery bombardment.

Berlin states nothing of importance has occurred.

**EASTERN EUROPE.**—Stubborn fighting along the 230 mile front between Chartoryisk and Novo Selico continues. In the South the operations are divided into those in the Styr and the Dniester valleys respectively.

**MISCELLANEOUS.**—The Military Service Bill was introduced in the House of Commons: its chief feature being that all unmarried men and widowers between 18 and 41 who failed to attest under the "Derby scheme" shall be required to make attestation now. Ireland being excluded from the operation of the bill.

*January 5th.*

**WESTERN EUROPE.**—On the Southern portion of the British front, artillery on both sides has been more active than usual; elsewhere only normal. Near Maricourt a hostile attack on an outpost was driven off by rifle fire. British airplanes raided the enemy's aerodrome at Douai, and a German airplane dropped bombs over Boulogne, no damage being done.

On the French front between Hill 193 and the Butte de Tahure a strong German attack was repulsed during the night of 4/5th.

The Berlin communiqué reports "there was artillery and mine fighting at various points of the front."

**EASTERN EUROPE.**—The Russians are now established on the heights commanding Czernowitz, thus making steady progress in the Bukowina territory and towards the frontier of Roumania.

**MESOPOTAMIA.**—On the afternoon of the 2nd Jan. the Turks shelled Kut-el-Amara for an hour, continuing again on the morning of the 4th.

A Constantinople communiqué states that all attempts of the enemy's detachments near Ali Gherb 80 miles from Kut to assist the army at Kut-el-Amara have failed.

**CENTRAL AFRICA.**—The officer commanding the naval expedition to Lake Tanganyika states that on 26th December the German armed steamer "*Kingani*" was attacked and forced to surrender after an action of 10 minutes: the shores of the lake form the frontiers of the British, Belgian and German possessions and the enemy having had the free use of the waters were enabled to transport troops and stores from Ujji to the Southern end of the lake.

**MISCELLANEOUS.**—The British casualties on the Western front from 25th Sept. to 18th Oct. covering the losses in the battle of Loos and in operations at adjacent parts of the front are announced officially as 2,378 officers including 773 killed and 57,288 other ranks including 10,345 killed.

*January 6th.*

**WESTERN EUROPE.**—Another bombing raid was carried out on 5th by eleven British machines against a store depôt at Le Sare.

There was artillery activity about Ypres and Armentières; and North of the Somme a patrol dispersed a party of Germans with hand grenades. On the Belgian front the enemy were bombarded in the region of Steenstraete, Het Sast, and Boesinghe: in Artois, and Champagne during an intense bombardment, an entire German installation for delivering gas attacks was destroyed.

Berlin reports artillery duels of lively character, and the bombardment of Lens by the enemy.

**SOUTH AFRICA.**—General Smuts has reviewed the troops who are to take part in the East African campaign under the command of General Sir H. L. Smith-Dorrien.

**GALLIPOLI.**—The following is a summary of the despatch of General Sir Ian Hamilton, C.-in-C. M.E.F., published in the *London Gazette* of 4th January, describing the combined operations involving the landing at Suvla Bay and the attack both there and at Anzac.

General Hamilton deals with the situation in Gallipoli as it appeared to him early in July: and, states that neither his Northern or Southern Forces were strong enough to fight their way to the Narrows, as was shown by the battles of the 6/8th May.

On 10th May, two fresh divisions were cabled for to prevent an attack degenerating into trench warfare, and on the 17th two Army Corps were asked for.

The different courses to be adopted are discussed in the despatch: the one determined on being a reinforcement of the Australians and New Zealand Army Corps at Anzac, combined with a landing in Suvla Bay. Then with one strong push to capture Hill 305 and working from that dominating point to grip the waist of the Peninsula.

From the Naval point of view the auspices were favourable: Suvla Bay was one mile only further from Mudros in the Isle of Lemnos than Anzac, and its possession would ensure a submarine-proof base and a good harbour excepting from S.W. gales. A vigorous offensive from Anzac, combined with a surprise landing North of it, were the means to be adopted to win through to Maidos.

The action of the 12/13th July was intended as a sequel to that of the 28th June. The action on the 12th July is described in detail; the British casualties were about 3,000 and those of the enemy 5,000; and the attack resulted in a "solid and enduring advance being achieved."

On the 17th July, Lt.-General Hunter Weston, commanding the 8th Corps was invalided home and the command was temporarily assigned to Lt.-General Hon. Sir F. Stopford, whose own Corps of the New Army was assembling at Mudros.

On the 31st July a further action took place at Anzac, fought by the 3rd Australian Bde.

The "great venture" was fixed for the 6th August: the general idea in the words of the despatch being:—

- (1).—To break out with a rush from Anzac and cut off the bulk of the Turkish Army land communication with Constantinople.
- (2). To gain such a command for my artillery as to cut off the bulk of the Turkish army from sea traffic whether with Constantinople or with Asia.
- (3). Incidentally to secure Suvla Bay as a winter base for Anzac and all the troops operating in the Northern theatre.

Anzac was to deliver the main blow, Helles and Suvla were complementary operations.

The details of the fighting at Anzac and of the landing at Suvla Bay are described in detail.

Finally the despatch states that up to the date of 17th October, the flow of munitions and drafts fell away and sickness broke out amongst the troops, so that there was no longer any question of operations on a grand scale. The C.-in-C. proceeded home on 17th October to report on the question of an early evacuation.

He mentions the exploits of both the Royal Naval Air Service and also that of the French, and of the Armoured Car Division (R.N.A.S.) and as regards the Royal Artillery, he states "by their constant vigilance, by their quick grasp of the key to every emergency, by their thundering good shooting, by hundreds of 'deeds of daring, they have earned the unstinted admiration of all their comrades 'services': and as for the junior R.A. Officers, 'their audacity in reconnaissance, 'their insouciance under the hottest of fires, stand as a fine example not only to the army, but to the nation at large." Of the Stretcher Bearer Corps the General says "no braver corps exists": he mentions also "The incomparable 29th Division," the "Young veterans of the Naval Division" and the "ever-victorious Australians and New Zealanders." Throughout the despatch many units are mentioned in the highest praise.

*January 7th.*

**WESTERN EUROPE.**—From British Headquarters a hostile infantry bombing attack supported by artillery, about the Armentières—Lille railway is reported, the attack being driven off: the enemy's trenches were considerably damaged at various points by our artillery.

On the French front our ally's artillery carried out bombardments at important centres.

Berlin Headquarters report "no news."

**EASTERN EUROPE.**—The Russians have captured the town of Chartoryisk and the heights beyond: and the enemy are fiercely resisting their advance towards Kovel. But the main point of interest on the Russian front is Czernowitz close to the Rumanian frontier. The Headquarters of Von Mackensen are reported to be close to the town, and all the enemy's available reserves are being concentrated in the neighbourhood.

**NAVAL.**—The Admiralty report the loss on 6th Jan. of a British submarine off Texel Island the entire crew having been rescued outside territorial waters by a Dutch cruiser.

*January 8th & 9th.*

**WESTERN EUROPE.**—On the 8th a British mine was exploded near La Bassée canal; and unimportant artillery engagements took place at various points on the British front.

In the Vosges the enemy have had some slight successes on the Southern slopes of the Hartmannsweilerkopf.

During the night of 8/9th there was heavy rifle, machine gun and artillery fire, and during the day unusual artillery action at Hulluch and Ypres.

**EASTERN EUROPE.**—On the Russian front, violent attacks have been made to drive our ally from Chartoryisk, which have all failed. N.E. of Czernowitz the enemy have made desperate counter-attacks.

From Vienna it is reported that the Russian attacks on the Bukowina border have been repelled.

Russian torpedo boats and a ship of the line in the Black Sea have had 4 encounters with the Turkish cruiser "*Goeben*": the latter after a long range fight retired into the Bosphorus.

**GALLIPOLI.**—General Sir C. Munro reports the complete exacuation of the Peninsula: all the guns and howitzers were got away except 17 worn out pieces, which were blown up by the British

before leaving: there was only one casualty amongst the whole allied force.

NAVAL.—The Admiralty announce the sinking of H.M.S. "*King Edward VII*" after striking a mine in a heavy sea. There was no loss of life and only 2 men were injured. She was a pre-Dreadnought battleship of 16,350 tonnage.

*January 10th.*

WESTERN EUROPE.—From British Headquarters artillery activity is reported, and enemy aircraft attacks on Hazebrouck and St. Omer. In Champagne the enemy have made violent attacks to regain the ground lost in September: they met with some success at two points, but by counter-attacks the French were successful in reoccupying nearly the whole of their lost positions.

EASTERN EUROPE.—There has been calm generally on the whole Russian front. In Galicia the enemy in the recent fighting have suffered enormous losses and are at present showing little activity.

Berlin and Vienna report no change and no important fighting.

GALLIPOLI.—The French report the evacuation of the Peninsula as having been thoroughly prepared for some days past and perfectly organised by the British commander of the French Expeditionary Corps. Six naval French guns are included in the seventeen reported as destroyed. The enemy opened fire at 4 a.m. when the embarkation was completed.

BALKANS.—The Austrians invasion of Montenegro continues in the North: and an offensive is being pressed against Mount Lovtchen, overlooking the Bay of Cattaro in the South.

MESOPOTAMIA.—It was announced in the House of Commons that on the 6th Jan. General Aylmer left Ali Gherbi with troops for the relief of Kut-el-Amara and on the same day General Townshend at Kut sustained a heavy fire on his N.W. front, but was not attacked. On the night of 7th General Aylmer experienced heavy fighting on both banks of the Tigris 2 or 3 miles below Sheik Saad and 25 miles E. of Kut. On the right bank General Kemball's column carried the enemies position, but on the other bank the enemy had 3 divisions and the main attack was retarded; on the evening of the 8th General Aylmer was unable to make progress owing to the fatigue of his troops; but on the 9th he telegraphed the retreat of the enemy and his pursuit of them, though hindered by rain. General Nixon has relinquished his command owing to ill health and has been succeeded by Lieut.-General Sir P. Lake.

*January 11th.*

WESTERN EUROPE.—A quiet night is reported on the British front, but during the day considerable activity on both sides about Hulluch and Ypres: artillery combined with trench mortar and grenade practice have been particularly effective near Armentières and St. Eloi.

Between the Avre and the Oise on the French front the enemy

by night made a strong reconnaissance, but were decimated by our ally's fire.

The Germans deny the successes of the French in the recent fighting in Champagne.

Near Dixmude there have been aircraft contests of some importance.

GALLIPOLI.—General Munro in a further report of the evacuation of the Peninsula: states that on the 7th Jan. the Turks attempted a heavy attack on our lines at Helles, when our casualties were 5 officers and 130 men. The night of 7/8th was fine and the evacuation and operations were successfully continued. After 4 p.m. on the 8th a gale sprung up, and the troops had all to embark at W and Y beaches: but by 4.0 a.m. all beach parties were embarked. The Turkish artillery were practically silent all night.

BALKANS.—The Austrians claim to have captured Mount Lovtchen commanding on the West, the Austrian port Cattaro, and on the East, Cettigne the capital of Montenegro.

#### *January 12th.*

WESTERN EUROPE.—A raid was carried out on the night of 11/12th by our troops on the enemy's trenches E. of Armentières: 20 of the enemy were disposed of. The artillery on both sides have been active about Vermelles and Pilkem.

Two hostile airplanes bombed Dunkirk causing insignificant material damage.

Artillery bombardment occurred at various points on our ally's front.

A German magazine at Lille is reported from Berlin to have been blown up, 150 casualties occurring.

EASTERN EUROPE.—Russian offensive, after achieving important results, is said to be suspended: whilst Vienna reports that bitter fighting has again taken place.

BALKANS.—A French detachment have landed at Corfu, to prepare for a concentration of Serbians coming from Albania.

The Germans are repairing the Vardar bridges destroyed by the allies during their retreat, and the delay in their advance will probably postpone operations in Macedonia.

#### *January 13th.*

WESTERN EUROPE.—On the British front near Givenchy on the night of 12/13th the enemy exploded a mine and followed it up with a bombing attack, which was driven back: the day was quieter than usual.

Four of our airplanes sent out on 12th Jan. had not returned. Berlin report 4 British airplanes shot down and 6 English air officers dead and 2 wounded.

The French in Artois violently bombarded German positions on the Lille road, and effective work of their artillery at other points on the front is recorded.

**EASTERN EUROPE.**—Petrograd briefly reports the severe fighting on the Bessarabian frontier, N.E. of Czernowitz, by stating that the enemy were forced to evacuate some trenches: the German prisoners taken report the Russian artillery fire as overwhelming.

**BALKANS.**—The allies have blown up the railway bridge over the R. Struma at Demir-Hissar 45 miles N.E. of Salonika and on the main Southern railway to Constantinople; and also the bridge at Kilindir: this should delay any Turkish advance from Xanthi on the Eastern Greek frontier, where the Turks are said to be concentrating for a simultaneous advance with the Bulgarians from Ghevgeli and the Austro-Germans from Monastir.

**MESOPOTAMIA.**—A Delhi communiqué states that General Aylmer's relieving force was still halted on the 10th, the weather being unfavourable.

**MISCELLANEOUS.**—A list of 3400 officers and men who receive rewards for war service is published.

*January 14th.*

**WESTERN EUROPE.**—On the British front the enemies trenches about Givenchy were heavily bombarded and considerable damage done. Artillery on both sides has been active about Kemmel and Hill 60.

The dispatches from Paris and Berlin show that no considerable fighting on the Western front has taken place owing to the weather.

**ITALY.**—The Italian Minister reports the sinking of an Austrian cruiser by a French submarine in the neighbourhood of Cattaro.

**PERSIA.**—Turkish troops are stated to have reached Kerman-shak: the Russian force is between that place and Hamadan, on the road from Teheran to Bagdad. The Russians are also advancing on the Southern road towards Ispahan.

**BALKANS.**—The Austrians occupied Cetinje on the 13th without much resistance and with little damage to the town. When Mount Lovtchen fell, it was doubtful if Montenegro could continue the struggle, and Austria is stated to have offered an armistice on terms.

**MISCELLANEOUS.**—The King addressed a message to the 16th (Irish) Division before leaving for active service.

A large expanse of country in North Holland has been flooded owing to storms having broken the dykes.

*January 15th & 16th.*

**WESTERN EUROPE.**—On the British front on the 15th there was the normal artillery activity.

On the 16th there was satisfactory artillery fire against a strong point N. of Ypres, but on the whole a quiet day.

On the French front there was nothing of importance to record on the 15th, further than lively artillery actions in Champagne, the Argonne and in the Woëvre.

Berlin reports the British having fired into Lille: and that an enemy monitor unsuccessfully bombarded the region of Westende.

**EASTERN EUROPE.**—Vienna announces the Russians as having made heavy unsuccessful attacks on the Bukowina frontier; the Russian reports of the fighting however have not been received yet.

**ITALY.**—On the heights and N.W. of Gorizia, the Austrians followed up an intensive bombardment by an attack, which succeeded partially; the following morning a violent counter-attack drove back the enemy beyond Oslavia.

**BALKANS.**—The defensive lines around Salonika are stated to be as strong as those in France and Flanders, and the long threatened attack is awaited with confidence.

A French air squadron on the 13th successfully shelled the Germano-Bulgarian Hd. Qrs. N. of Ghevgeli. The destruction of the railway bridges previously mentioned was to prevent the Turks transporting their heavy guns from Gallipoli to the Greek frontier.

**PERSIA.**—The Russian and Turkish troops have been in conflict at Kangavar between Hamadan and Kermanshah and the Russians have occupied the town.

*January 17th.*

**WESTERN EUROPE.**—On the British front on the night of 17/18th the enemy showed activity with trench mortars and bombs at Givenchy, and during the day our troops made a combined attack at the same place with excellent results. At other portions of the line there was effective bombardment. On the French front the artillery were fairly active between the Somme and the Ancre.

Berlin reports the enemies gun fire at Lens as having killed and wounded 16 inhabitants.

**EASTERN EUROPE.**—The Russians in Bukowina are still silent about the fighting there, which continues unabated. In the Pinsk area the Russians appear to be piercing the enemies front in several sectors.

**BALKANS.**—Montenegro is reported to have capitulated to the Austrians, an unconditional armistice having been accepted by King Nicolas, pending terms of capitulation being arranged.

**MESOPOTAMIA.**—Mr. Chamberlain in the House of Commons announced that the recent operations including the advance to Ctesiphon were considered and approved by the War Council. On the 12th Jan. the enemy who had retired six miles E. of Kut on the 11th, again advanced to the Wadi position. General Kemball on the right bank was holding the enemy and General Aylmer on the left bank was pressing back 2 divisions of the Turks; there was continuous fighting on the 13th, and on the 14th the enemy on the left bank were retiring: on the 15th the whole of the Wadi position had been captured and the enemy's rear guard were taking up a position at Es Sinn. General Aylmer's pursuit was seriously hampered by the weather: all the wounded had been sent down the river.

*January 18th.*

**WESTERN EUROPE.**—On the British front at Fricourt near Albert, on the 17th, a large portion of the enemy's parapets were de-



stroyed by a mine; the enemy suffering considerably from the explosion and the artillery fire that followed. To-day was quiet except for intermittent artillery fire.

On the French front artillery bombardments are reported.

ITALY.—On the heights N.W. of Gorizia the counter offensive by the Italians against the enemy, which began on the 15th January, has ended in the success of our ally.

BALKANS.—King Nicolas states the capitulation of his country was a question of either surrender or ruin.

#### *January 19th.*

WESTERN EUROPE.—On the 17th sixteen British airplanes attacked an enemy supply depot at Le Sars, N.E. of Albert, causing much damage.

In the course of 19 air fights, 5 enemy machines were driven down and 2 of our airplanes were lost. Hostile artillery were active near Fromelles and Ypres. On the night of 18/19th Nancy was attacked by 2 German aircraft; whilst a French air squadron bombarded the railway stations of Metz and Arnaville.

EASTERN EUROPE.—Vienna announces that the Russian offensive on the East Galician and Bessarabian front may be considered at an end.

CAUCASUS.—The Russians have advanced on a front of about 70 miles, extending from Lake Torbun on the Black Sea side to Melazgert in Armenia, and have routed the enemy principally on the Kars to Erzurum road. They have occupied the town of Köprikrin, 33 miles from Erzurum, the Turks headquarters on the Persian front; there have also been engagements with Kurds, S.W. of Lake Urumiak.

#### *January 20th.*

WESTERN EUROPE.—From British Head-quarters airplane fighting is chiefly reported. In the course of 14 fights on the 19th, one British machine was lost, and two on the German side were driven into their lines: 17 British machines have been lost since the 16th December. A mine near Fricourt was exploded.

Berlin reports the bombardment of artillery works at Nancy.

EASTERN EUROPE.—In the Dvinsk region and in Galicia on the middle Strypa, minor actions have taken place. On the S.W. portion of the Russian front, a definite success in Bukowina, to the N.E. of Czernowitz is now announced, where a sector of the enemy's position was captured, several counter attacks being also repulsed. Vienna mentions that the battle on the Bessarabian frontier is proceeding with increased violence.

BALKANS.—The capitulation of Montenegro has not yet been carried out. Dedeagatch has been again bombarded by an Allied naval force for 4 hours.

In the Black Sea Russian torpedo-boats raided the coast of N.E. Anatolia and destroyed 163 sailing ships, 73 of which were laden with provisions.

**CAUCASUS.**—The Russians have captured the town of Köprikrin, 33 miles from Erzurum; the enemy's resistance was broken on a front of 70 miles, and he suffered heavy losses in men and material.

**MESOPOTAMIA.**—The Turks are posted at Es Sinn, 7 miles from Kut-el-Amara: and General Aylmer's relieving column is reported as close to the enemy's position. No fighting or firing at Kut has occurred.

**NAVAL.**—The Admiralty announce the grounding of a British submarine off the Dutch coast; no lives were lost.

*January 21st.*

**WESTERN EUROPE.**—From Flanders and France artillery bombardment and mine explosions of a minor nature occurred. Berlin reports nothing of importance on the Western front.

**BALKANS.**—An Allied squadron on the 20th bombarded the Bulgarian town of Porto Lagos.

**CAUCASIAN FRONT.**—The Grand Duke Nicolas has gained a striking victory in Armenia, where he has driven the Turks to Erzurum; Hassan Kale, in the valley of the Aras fell, when the enemy fled in disorder to the protection of the forts of Erzurum, losing 1,500 killed and prisoners, and a large quantity of military stores.

The Russians have also captured Sultanabad, which is midway between the two main routes from Teheran along which they have been advancing.

**CAMEROON.**—Since the occupation of Yaunde by our troops on the 1st January, columns have been pressing on the enemy, endeavouring to cut off his retreat to the small Spanish territory of Rio Muni: a French column has also advanced from the French Congo with a similar object.

*January 22nd & 23rd.*

On the 22nd Hulluch, Richebourg and Pilkem, were successfully bombarded, and at Fricourt the artillery on both sides were active. Near the Comines Canal the enemy sprang a mine which our troops occupied: in Belgium the enemy's works at Nieuport were shelled. On the 23rd there were mining operations at certain points of the British front.

On the French front on the 22nd artillery actions only are reported: on the 23rd the Germans attacked in the region of Neuville St. Vaast, and on a front of several hundred metres penetrated the French trenches, from which they were immediately dislodged by counter-attacks. 24 French machines bombarded the station and barracks at Metz dropping 130 bombs: the bombarding machines were accompanied by two protecting squadrons which fought ten actions with Fokkers and Aviatiks: one machine only failed to return.

**EASTERN EUROPE.**—There has been inconclusive fighting in the Dvinsk region, to the N. of Chartoryisk on the River Styr, and also on the Galician and Strypa front.

MESOPOTAMIA.—The India Office reports that General Aylmer attacked the Turks position at Es Sinn on the 21st, and fierce fighting ensued with varying success. Owing to bad weather and floods it was impossible to renew the attack on the 22nd, and our position was taken up 1,300 yards from the enemy's trenches: the casualties on either side are reported as very heavy. Es Sinn is a strongly fortified position, and the enemy are stated to have received reinforcements from the Russian front in Armenia, where the Russians are pressing hard on the Turks, and bombarding Erzurum.

AIRCRAFT.—The War Office report that at 1 a.m. on the 23rd January, a hostile airplane visited the East Coast of Kent in bright moonlight, and after dropping 9 bombs in rapid succession made off seawards. Some damage was caused to private property, and 7 casualties to persons, 1 being killed. At noon on the same day 2 hostile seaplanes made a second attack on the same locality: after coming under heavy fire the raiders disappeared pursued by our machines: no damage or casualties are reported.

*January 24th.*

WESTERN EUROPE.—On the British front a mine near St. Eloi was exploded, damaging the enemy's trenches considerably: the artillery have been active about Loos, N.E. of Armentières, Hooze, St. Jean, and Pilkem. The French communiqué records unusual air-raids by allied squadrons: bombs having been dropped at Houthulst and Middlekerke and in the Metz area.

BALKANS.—Scutari in Albania has been occupied by the Austrians, and an Austro-Bulgarian army having taken Berat, are now advancing on Avlona and Durazzo on the Albanian coast.

Monastir and Ghevgeli were attacked on the 23rd by a squadron of 40 French airplanes, one portion proceeding to Ghevgeli where 100 bombs were thrown. The distance flown to Monastir was over 100 miles over mountains of 6,000 feet, and there 204 bombs were dropped over the enemy's camps and other military establishments: the machines all returned safely.

Berlin reports that an enemy airplane squadron dropped bombs on Monastir, when several inhabitants were killed or injured.

EGYPT.—The British column under General Wallace attacked and burnt the camp of the Sensussi on the 23rd in Western Egypt.

MESOPOTAMIA.—Sir Percy Lake reports an armistice having been concluded for a few hours on the 22nd, for the burial of the dead and removal of the wounded. The Tigris having risen 7 ft. at Kut, and 2½ ft. at Amara, has prevented all movements of troops by land. General Townshend reports having sufficient supplies, and that he has not been engaged again.

AIRCRAFT.—It was further announced that a German seaplane flew over Dover at 4 p.m. on the 23rd: it was engaged by our anti-aircraft guns and pursued by two British machines.

The Under-Secretary for War stated that during the recent raid the hostile aircraft were fired at by our anti-aircraft guns on land and sea, also that 4 of our military airplanes and 2 seaplanes

went up in pursuit, but the raider had got too far ahead to be overtaken.

He further stated that in the last four weeks 13 British and 9 German machines have been lost and brought down on the Western front, and probably 2 additional German ones.

1227 British machines have crossed the enemy's lines, 310 German ones only passing across our front.

*January 25th.*

**WESTERN EUROPE.**—On the British front there have been successful artillery bombardments at several points, and hostile artillery have been active near Gommecourt, about Loos and at Hooge: aircraft has been also active on both sides, ours maintaining the supremacy. 27 French and British airmen bombarded Ghent some few days ago.

Both French and Belgian artillery during the night bombarded in the Nieuport district, and frustrated an enemy's attack in the direction of the mouth of the Yser.

In the angle formed by the Arras-Lens and the Neuville St. Vaast-Thelus roads, the Germans started an attack on a front of 1,600 yards preceded by a bombardment, the final result being a success for our ally.

The enemy dropped bombs from 2 airplanes at 6 a.m.: and a German seaplane was forced to the water by a British machine N.E. of Nieuport about 8 a.m.

Berlin reports that in Flanders their artillery strongly shelled the enemy's positions and were successful in their attacks, and took prisoners.

**BALKANS.**—The recent allied airplane raid on Monastir is reported to have done considerable damage. King Nicolas of Montenegro and his Queen have arrived at Lyons; during their flight from Podgoritzta they were fired upon by airplanes, and also attacked by submarines whilst crossing to Italy.

The Austrians announce the complete disarming of the Montenegrin army.

**AIRCRAFT.**—Berlin reports with reference to the recent aircraft raid on the night of the 22/23rd January, that one seaplane dropped bombs on the railway station, barracks and docks at Dover: and on the afternoon of the 23rd two seaplanes dropped bombs on the airship sheds at Hougham (West Dover): the outbreak of a heavy fire was ascertained beyond doubt.

*January 26th.*

**WESTERN EUROPE.**—The dispatch from the British Head-quarters reports that 27 hostile airplanes were encountered and 3 captive balloons attacked. Two airplanes and two balloons were forced down, and all our machines returned safely. During the night there was a hostile bombardment about Loos, which continued during the day: S. and S.W. of Armentières the enemy's artillery have been active.

In Belgium in the district of Steenstraate the enemy's trenches and communications were effectively bombarded. In Artois cannonading on both sides has been extremely violent. A Zeppelin which crossed the French lines and dropped bombs on villages, did little harm.

**EASTERN EUROPE.**—Petrograd announces enemy's airplanes as active on both banks of the Dvina and at Dvinsk: a Zeppelin also flew over that area. On the middle Strypa front the enemy without result bombarded our ally's positions. On the Caucasian front large quantities of provisions and live stock have been captured from the Turks.

**BALKANS.**—The Austrians now hold the whole coast line of Montenegro and a large portion of the interior: they are also sweeping Albania from the North and East: San Giovanni di Medua, a northern Albanian port, has fallen to the enemy; who are advancing on Durazzo, and also against the Italians at Avlona.

**EGYPT.**—The War Office reports further that General Wallace's force of British, Dominion and Indian troops, on the 23rd January, moved forward in two columns: the enemy attempted to surround them and by 10 a.m. the action became general, but by 12 noon the Senussi were driven back: in this march against the enemy the weather was very unfavourable. Our losses were 28 killed and 274 wounded.

**MESOPOTAMIA.**—It now appears that the last action took place 23 miles below Kut el Amara and not seven.

**EAST AFRICA.**—General Sir H. Smith-Dorrien reports that on the 24th January our troops advanced from Mbuyuni, 15 miles E. of Taveta, and drove off the enemy and occupied their camp. This is the first report in this theatre of operations, in which no advance has hitherto been possible: a large S. African contingent is now being raised specially for this campaign.

**AIRCRAFT.**—The Under Secretary of State for War stated in the House of Commons with reference to the recent visits of hostile aircraft to the Kentish coast, on the occasions on which British airplanes ascended to attack the enemy, the lapse of time between the sighting of the enemy aircraft and the ascent of the British machines, was that required to prepare the machines for flight. The report that enemy aircraft were cruising about in broad daylight for 2 hours is untrue.

*January 27th.*

**WESTERN EUROPE.**—British Head-quarters report that a mine was exploded opposite Givenchy: and on several portions of the British front, organised bombardments were carried out against the enemy. On the whole French front the artillery was very active.

Berlin reports the bombardment of positions in the neighbourhood of Westende, by their enemy's land artillery, in conjunction with monitors, but to no purpose.

**EASTERN EUROPE.**—There have been no occurrences of importance to record on the Russian front. In the Caucasian area

a Turkish attempt to assume the offensive about Erzurum was stopped.

MESOPOTAMIA.—General Townshend reports that the enemy have evacuated their trenches on the land side of Kut defences, and retired to a distance of one mile from our entrenchments.

NAVAL.—It is stated that 95 survivors of H.M.S. boarding steamer "Tara," torpedoed in November, 1914, are in the hands of the Senussi in Western Egypt.

*January 28th.*

WESTERN EUROPE.—A salient in the British lines N.E. of Loos was attacked by the enemy's infantry, who were driven back. Artillery on both sides were active E. of Armentières, and between Loos and La Bassée canal.

On the French front a series of German attacks were made and more particularly near Arras.

As a reprisal for the Zeppelin bombardment of villages in the Epernay region on the 25th January, a French dirigible dropped bombs on the town of Freiburg in Breisgau, on the night of the 27/28th January, when much damage was done.

EASTERN FRONT.—In Bukowina the Russians report a large increase in the enemy's machine and heavy guns; at the same time a withdrawal from that front of many entire units has been noticed.

CAUCASIAN FRONT.—A large Turkish column was crushed in the region W. of Melazgert, and many prisoners and warlike stores captured. In Persia, S of Lake Urumiah, E. of the Turkish frontier the Russians obtained a success over Turks and Kurdish irregulars.

EGYPT.—In the fighting on the Western frontier of Egypt on the 23rd January, the losses of the enemy far exceeded those incurred on 25th December, and the local Bedouins with the Senussi are reported to be deserting and returning East.

MISCELLANEOUS.—The Prime Minister states that the total British casualties up to January 9th were 549,467 all ranks, compared with 528,227 up to December 9th: they are made up as follows: France, 400,510; Dardanelles, 117,549; other theatres, 31,408: out of the total, the killed number 128,138.

*January 29th & 30th.*

WESTERN EUROPE.—At Carnoy, N. of Somme, 5 miles S.E. of Albert, the enemy entered some British saps in the evening of 28th, after a heavy bombardment, but were driven out the next morning. The shelling about Loos has been heavy, and our artillery has done considerable damage to the enemy's trenches at other parts of the front. On the 30th the day was foggy and nothing of importance occurred. On the French front a week of fighting concluded with further German attacks at Frise on the south bank of the Somme, and at Dompierre, 2 miles S. of Frise and 20 miles S. of Arras, and where the French and British fronts join.

At Dompierre the enemy were twice driven back, but Frise was captured by the Germans, after a violent bombardment, who claim to have taken 1,300 prisoners: as a result of counter-attacks our ally has re-occupied some of the lost trenches. Attacks have made by the enemy in the past week extending from sector to sector on the British and French fronts, from near to the Belgian coast, and a weak spot having been found a local success was obtained at Frise.

**BALKANS.**—French airplanes on the 28th January bombarded and shelled a Bulgarian camp of 600 tents at Pazarli, N. of Doiran, and 50 miles from Salonika: the squadron returned without loss.

The Allies have occupied Kara Burun and neighbourhood at the Eastern entrance of the Gulf of Salonika, its fortress guarding the harbour: a British transport had been previously torpedoed under the guns of the fort.

**AIRCRAFT.**—On the night of 29/30th a Zeppelin flew over Paris at a height of 10,000ft., and dropped 13 bombs killing 23 people and injuring over 30; the bombs all fell in a few minutes within an area of about half a mile: the night was misty and dark, but the raider was located and attacked by airplanes.

*January 31st.*

**WESTERN EUROPE.**—British Head-quarters report that on the night 30/31st, the German trenches about the Kemmel-Wytshaete road (S. of Ypres) were entered by a British party, and 40 casualties were inflicted on the enemy. During the day there was considerable activity about Fricourt, to the N. of Loos and Wulverghem. The French communiqué records only the normal grenade and mining activities

**EASTERN EUROPE.**—In the Riga and Dvinsk regions, artillery actions are mentioned. On the Caucasian front the Russians have during a fortnight's operations driven the Turks a distance of 40 miles to Erzurum: they themselves having now come down from mountainous regions into a well populated and accessible country.

**MESOPOTAMIA.**—A British reconnaissance near Shattrah 90 miles from Kut and 70 miles W. of our line of communications on the Tigris, was attacked by Arabs; our losses were few, the Arabs heavy.

**AIRCRAFT.**—The War Office announce that a Zeppelin raid by six or seven airships took place on the night of the 31/1st February over the Eastern and N. Eastern and Midland Counties, when a number of bombs were dropped.

Paris was again visited by a Zeppelin on the night 30/31st, bombs were dropped but without however doing any damage or causing injuries.

Summary of a despatch from Vice Admiral Sir R. S. Bacon, K.C.B., commanding the Dover Patrol, reporting the operations off the Belgian coast between August 22nd and November 19th 1915.

The Admiral states that he sailed with H.M. ships *Sir John Moore*, *Lord Clive*, *Prince Rupert* and 76 other vessels and auxiliaries and on the morning of the 18th August attacked the defences on the Belgian coast with successful results.



On September 6, Ostende was attacked with five Monitors when damage was done to submarine workshops and harbour works. The fire was returned by the enemy with heavy guns with considerable accuracy.

On the same day Westende was attacked by H.M. ships *Redoubtable*, *Bustard*, and *Excellent*, under Capt V. B. Molteno with good results.

On September 19 certain defences in the neighbourhood of Middlekirk, Raversyde, and Westende were attacked and the batteries damaged and silenced. The French batteries in the vicinity of Nieuport co-operating.

On September 24th, 25th, 27th and 30th further attacks were made on the Belgian Coast.

On October 2nd, the Admiral sailed with four monitors and again attacked Zeebrugge on October 3rd with satisfactory results: the whole coast showing signs of considerable alarm as a result of previous operations. The advanced vessels were attacked by submarines but without results.

On October 6th, 12th, 13th and 18th and November 16—19th other positions of military value have been attacked.

On the whole, six concerted operations of considerable magnitude have been carried out and eight other attacks on a smaller scale have been made.

The damage inflicted on the enemy is known to include the sinking of one torpedo boat, two submarines and one large dredger: three military factories have been destroyed, extensive damage to the locks at Zeebrugge, and the destruction of thirteen heavy guns also many storehouses, ammunition depôts, etc. Three British auxiliary vessels have been lost, and the total casualties have amounted to 34 killed and 24 wounded. Throughout the operations the vessels have been subject to the enemy's aircraft attacks.

(To be continued).



## THE ACTION OF THE BELGIAN ARMY IN 1914.

Translated from the "Memorial de Artilleria" for  
September and October, 1915.

BY MAJOR R. H. BENSON, R.A.

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We have received a publication containing the narrative by the Headquarter Staff of the Belgian army of the action taken by the army for the defence of the country and respect for her neutrality in the period 31st July—31st December 1914, from which we have made the following extract.

At the outbreak of the war neither the establishment nor the armament of the Belgian army had been brought up to the standard laid down in the recent scheme of re-organisation. Under that scheme the army was to have been brought up to a total strength of 350,000 by the end of 1918. But when war broke out the country was in the midst of a comprehensive military re-organisation which was far from completion. As regards armament, it may be noted that there was no Heavy Artillery.

The peace strength of the army consisted of 6 Divisions and one Cavalry Division. Of these the 1st, 3rd, 4th and 5th divisions with Headquarters at Ghent, Liege, Namur and Mons constituted the vanguard of the army and were distributed in such a way as to be able to oppose a threatened attack from whatever direction this might come; the 1st Division watching England, the 3rd Germany and the 4th and 5th France, the former opposing any attack on Namur and the latter an attack from the Maubeuge—Lille front. While any one of these divisions was opposing the opening moves of any attack the others would be brought up to the threatened front. The 2nd Division was based on Antwerp and the 6th, with headquarters of the cavalry division, was at Brussels.

The defensive system of Belgium comprised three fortresses; Antwerp as an entrenched camp and place of refuge, Liege and Namur as delaying fortresses, bridgeheads and *points d'appui*. As these places absorbed a large number of troops, the army was composed of field troops and fortress troops.

On the 29th July precautionary measures were taken, and two days later mobilisation was ordered in view of the gravity of the general situation, and 15 contingents were called up, the 7 older contingents being allocated to the fortresses and the 8 younger to the field army.

The plan of defence against the action of Germany was as follows. The third division, resting on the fortified position of Liege was to hold out as long as possible to give time for the other divisions to be brought up in support, and the 4th Division was to cover Namur. In accordance with this plan the 1st Division was moved from Ghent to Tirlemont, the 2nd from Antwerp to Louvain, the 5th from Mons to Perwez and the 6th from Brussels to Wavre

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the cavalry division forming a covering screen with headquarters at Waremmé, while one brigade of the 3rd Division was sent to Tongres, and one brigade from the 4th Division to Huy.

This concentration was begun on the 4th August and completed on the following day.

By the 6th August the army supply trains had been completed. Each division had been brought up to its full strength and consisted of either 3 or 4 mixed Brigades, 1 Cavalry Regt., 1 Regt. of Artillery, two companies of Engineers a Telegraph Section and a transport train. Each brigade consisted of two regiments of three battalions each, one brigade of three field batteries, a machine-gun company and a military police section. The independent cavalry division consisted of two brigades, a cyclist battalion, a brigade of three batteries, a cyclist pontoon company and a transport train. The total strength of the Field Army was 117,000 men, which was later to be increased by 18,500 volunteers.

The German note of the 2nd August led to the conclusion that their armies in traversing the country would not consider the Meuse as the Northern limit of the zone of operations, but as the pivot of their offensive movement against France, and from this it was deduced that forces vastly superior in numbers to the Belgian Army were about to cross Belgium.

The action to be taken by the Belgian army would depend upon (i) whether it found itself in presence of very superior enemy forces or (ii) found itself opposed by equal forces.

In the first case advanced defensive positions were to be taken up and held with a view to delaying the invader and giving time for the junction of the Belgian with the French and English armies; but if this junction were delayed the army was not to expose itself to serious risk and would therefore refuse a pitched battle against great masses, avoid being enveloped and make sure of a line of retreat which would enable it to join up with the French and English armies. In the second case the army was to attack the enemy at the most favourable opportunity, whether this were brought about by a too rapid and extended advance, with insufficient supports or by momentary exhaustion.

In addition, the fortified positions of Liege, Namur and Antwerp were to be defended.

On the morning of the 4th August the 2nd and 4th German cavalry divisions (about 12 Regts.) had crossed the frontier and invaded the Plateau of Herve. Avoiding the fortified position of Liege they reached the Meuse at Visé, finding the bridge blown up and the passages of the river defended by Belgian detachments. After some skirmishes two Hussar Regts. crossed the Meuse by the ford at Lixhe, above Visé, and the defenders withdrew to the line of the Liege forts. Behind the cavalry German forces of all arms from the VII, VIII, IX, X and XI Corps entered Belgium, their advanced guards reaching the line Bombaye—Herve—Remouchamps by noon on the 4th; while further back the III and IV corps were concentrated at and to the North of Saint-Vith, some 15 kilometres south of Malmedy. There were thus approximately 300,000 men marching against the Liege position.

On the 5th hostile cavalry detachments appeared at Tongres and to the south of Liege, at Plainevaux. An envoy demanded free passage and this being refused by the Governor of Liege, the German forces at once attacked the forts of Chaudfontaine, Fléron, Evegnée, Barehon and Pontise, but were repulsed in spite of being powerfully supported by heavy artillery. The attack on the Vesdre-Meuse sector of the defences having thus failed, an attack on the Ourthe-Meuse sector was begun on the night of the 5th 6th, and at the same time a detachment of two officers and 8 men attempted to capture the Governor in Liege itself—a *coup de main* which failed, all those who took part in it being killed.

It was now decided that the defence of the fortress should be undertaken only by the garrisons of the various forts, and the field troops, the 3rd Division and the 15th Brigade, accordingly withdrew towards the river Gette where the main army lay, and the Governor took up his position in Fort Lonein.

During the days following the departure of the 3rd Division, the forts kept up a heavy fire on any German troops coming within range. On the 12th August the hostile heavy siege artillery came into action directing its fire first against the forts on the right bank of the Meuse. The last forts capitulated on the 16th and 17th.

On the 6th August when the main Belgian army was concentrated in the quadrilateral Tirlemont—Louvain—Wavre—Perwez, about two days march from Liege, and the 3rd Division was marching to join it, the enemy, who had crossed the Meuse North of Visé, who was attacking Liege with three army corps and who was already in possession of the line of the Meuse at Liege and in its immediate neighbourhood, had already brought up forces greatly superior to any which could be opposed to him.

Behind Liege the first natural defensive position is the line of the river Gette and that part of the Meuse between Namur and Givet; its left rests on the river Démer, and it protects a large part of Belgium and bars the line of advance which the German armies appeared to be following.

It was therefore decided to hold this position but the Belgian army being inadequate in numbers to hold the whole length of the position, it was concentrated along the line of the Gette and at Namur. Here it would await the arrival of the allies to occupy the gap between the Gette and Namur and the line of the Meuse above Namur. In this position the army covered the capital, and more important still ensured the safety of its communications with Antwerp, its base of operations and the place where the whole of its reserves of food ammunition and miscellaneous supplies were stored.

The left of the army was to the N.E. of Tirlemont, its right at Jadoigne. In the first line were the 1st and 5th Divisions: in the second line, the 2nd Division was at Louvain and the sixth at Hamme-Mille. The 3rd Division, on arrival from Liege, took its place in the first line between the 1st and 5th Divisions. The vanguard was composed of the Cavalry Division, which, from its first positions round Waremmme, retired towards Saint-Trond, and later fell back on the left of the army, prolonging the line from the North of Tirlemont to the outskirts of Diest. The 4th Division was making



Plate I.





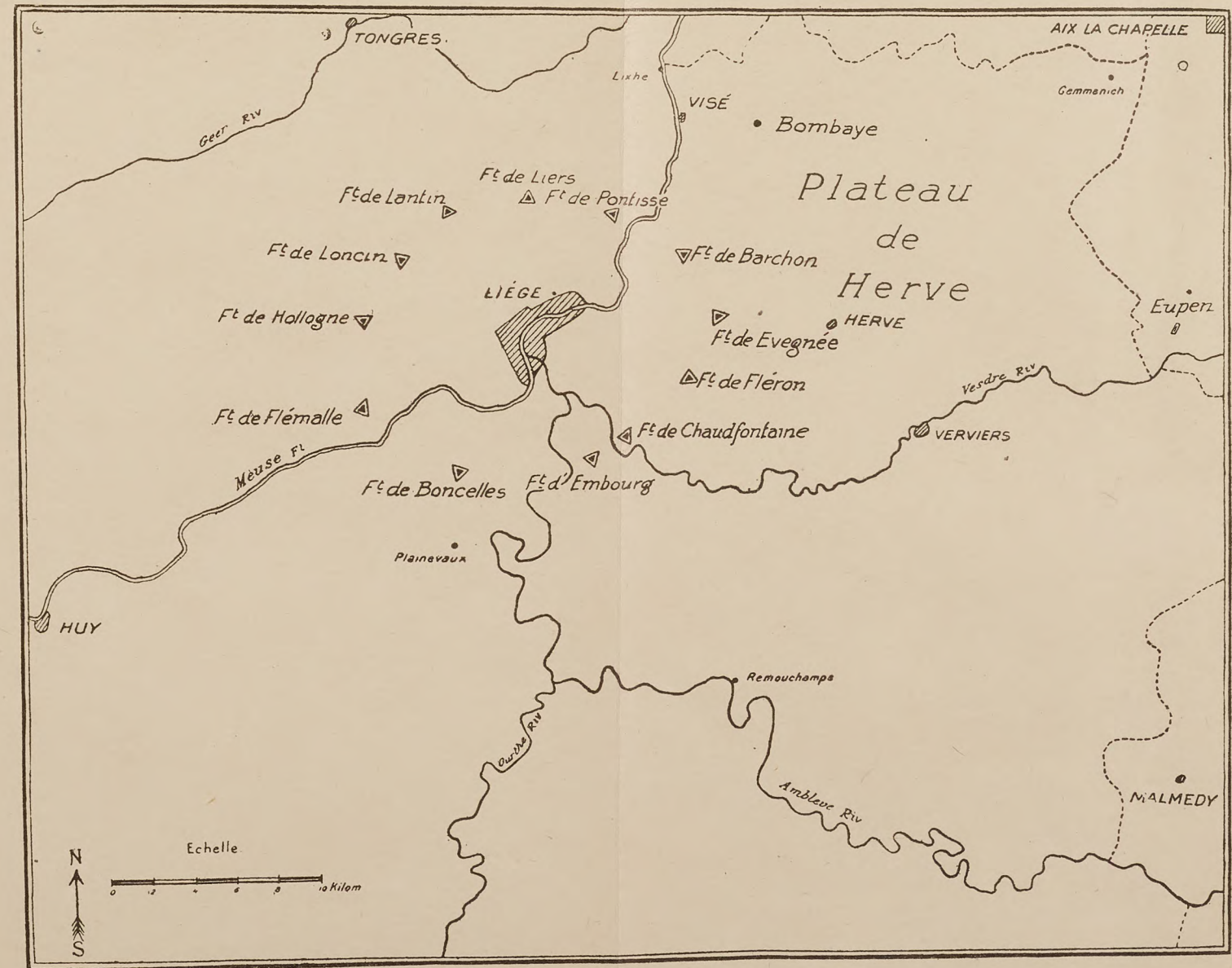


Plate II.





preparations for the defence of Namur as a *point d'appui* on the Meuse-Gette front and the 8th Brigade was at Huy.

On the 10th hostile cavalry appeared before the Belgian lines, and on the 12th an action was fought at Healen, which, although favourable to the Belgians, can only be regarded as an unimportant episode in view of the extent of the movements of the German forces. Towards the 17th very considerable hostile forces appeared on the front and flanks of the Belgian army; on the 18th the II, IV, and IX corps moved against the left flank between Diest and Tirlemont, their flank protected by the 2nd cavalry division which advanced between the Grand Nethe and the Démer: the III, VII and X corps which had crossed the Meuse between Liege and Huy were advancing against the Jodoigne—Namur front, preceded by the 4th and 7th cavalry divisions which were making for Wavre and Gembloux. Behind these six first line corps followed 5 reserve corps. Thus, independently of the German forces which were directed against the French frontier, crossing the Belgian provinces of Luxembourg and Namur, there were then 500,000 men in motion North of the Meuse.

At noon on the 18th then, when the Belgian army was on the point of coming into contact with immensely superior German forces, the 5th French army had one corps watching the bridges over the Meuse from Hestiere to Namur and those over the Sambre from Floreffe to Tamines; the other three corps were due to arrive at Philippeville on the 19th. This army was threatened by hostile forces, apparently amounting to 4 corps, which had appeared between Ivoir and Beauraing and which had attacked Dinant on the afternoon of the 17th. The English army was at this moment deploying, to the south of the Sambre, near Maubeuge, its cavalry division, the only force which had then been disembarked. The rest of the army would be ready to march perhaps by the 22nd and certainly by the 23rd August.

It will be seen, therefore, that the Belgian army, amounting to approximately two army corps, stood alone in face of 11 hostile corps of the 1st and 2nd armies, and that it was impossible to hold their position and to act in concert with the English and French armies. If it remained in the position which it had occupied since the 5th August and in which it had resisted the attacks of the German cavalry and advanced guards, it would run the risk of being annihilated in the battle which would have to be fought on the following day, the 19th, and of being cut off from Antwerp. For this reason a general retirement towards the North-East was ordered, with a view to taking up a position behind the Dyle, on the front Neerijssche—Louvain—Rotselaer; but in view of the result of rearguard actions and the enemy threat to the left flank the retreat had to be continued to line of the Antwerp forts. This position was reached on the 20th and found the army fit and ready to play its part in concert with the allies by detaining before Antwerp hostile forces at least equal in numbers to itself.

The Germans, following up closely, entered Louvain on the 19th and Brussels on the 20th, and crossed the French frontier on the 24th i.e. on the 23rd day after the mobilisation of the French Army.

(To be continued).

## MEMORIAL DE ARTILLERIA.

BY MAJOR R. H. BENSON, R.A.

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November 1915.

### *Modern Spanish powders.*

Discusses the need for a "progressive", (i.e. slow-burning) powder which will give higher muzzle velocities without increasing the maximum pressure in the bore. Shows how the present "progressive" powder has been evolved from the earlier quick burning powders in two stages, one mechanical and the other chemical. In the first the grains of powder are treated in such a way that the density of the grains is greater on the outside than at the centre, so that the rate of burning increases progressively as the grain is consumed. In the second various ingredients have been added to the powder proper which tend to retard the rate of burning: these being mixed with the outer layers only of the grains assist in accentuating the progressive rapidity of burning. Discusses the use of stabilisers and of "detective" agents, i.e. colouring matters, inert in themselves, which however are acted upon by the products of decomposition of the powder and change colour, thereby indicating that the powder has begun to decompose and can no longer be considered stable, or safe.

### *Portable fire arms; their effects on the user.*

The velocity of recoil is not, by itself, a reliable index to the severity of the shock which the weapon communicates to the user; and the same holds good of the energy of recoil. Effects of the recoil on the man using the weapon—shock, contusions, muscular fatigue and nervous excitation. With modern high velocity firearms the recoil is so severe and violent that its effects on the user are positively dangerous, producing bruises which sometimes cause lesions of the tissues affected, and fatigue which almost produces cramp or muscular spasms. The matter is so serious that it is questionable whether the present rifle and ammunition should be retained. The consequences of this recoil inevitably lead to bad shooting. Fire effect depends largely on careful aim and steadiness of the weapon at the moment of discharge. The shock of rapid firing is such that it is physically impossible for the majority of men to aim correctly or to hold the rifle steady after the first few shots, and it is therefore certain that accuracy will vanish and enormous waste of ammunition be caused. The adoption of a rifle (and a pistol) with milder recoil is strongly advocated.

### *Notes on the development of submarines.*

Points out that Nature's air-navigators, the birds, are heavier than air: and shows how human practice is coming into line with Nature's; points out how the early heavier-than-water submarines failed to make good, and shows that lighter-than-air aircraft are also

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failing to justify themselves. Traces the development of the lighter-than-water submarines from the original Holland boat to the latest British and German types. Points out that the present time is the heyday of the submarine, since it has reached a high stage of development but the counter-submarine, or "submarine destroyer" is hardly in existence, or if it exists is in its earliest infancy. Consequently he does not anticipate that the submarine will ever attain to greater relative importance among warships than it has now reached. Points out the fallacy of Sir Percy Scott's famous dictum that the day of the Dreadnought is over, and shows that at the present moment it is to her Dreadnoughts, not to her submarines, that England owes her command of the seas and all that that means to her, and that Germany's submarine blockade is a failure—mere pin pricks.

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December 1915.

A sketch of the theory of phases and its application to the study of ferro-carbon solutions (steels)—

(Too advanced to be of interest to the general reader).

Conclusion of article in previous issue on Ranging Field Batteries with percussion shrapnel.

There is nothing new or particularly interesting in this article.

"Report on Argentine horses for artillery purposes," by Captain C. de Cabanyes, Royal (Spanish) Artillery. The Argentine census of horses in 1908 showed that there were over  $7\frac{1}{2}$  million horses in the republic, of which over  $5\frac{3}{4}$  million were classified as 'Creoles' i.e. Argentine country-breds, nearly a million were 'un-classified' and the remainder were English and Arab thoroughbreds, Hunters, Hackney, Clydesdale Shire, Percheron, Suffolk, Yorkshire, Anglo-Norman and Cleveland Bay imported pure-bred animals and crosses of these with the native mares. Out of this total probably not more than  $1\frac{1}{2}$  million horses could be picked which would be suitable for artillery purposes. The country-bred horses are a very mixed lot, the result of endless and promiscuous crosses. It appears that the horse is not indigenous in the Argentine, but was originally imported from Spain in 1535 when a Spanish explorer, Don Pedro de Mendoza, abandoned 7 stallions and 5 mares—Barbs and Andalusians—before returning to Spain. From these 12 animals the country-bred Argentine horse of today is descended, though many other strains of blood have been brought into the country from time to time to mix with the native strains. For many years horses were bred in the country mainly for agricultural work, without care or any thought of improving the breed; the animals bred and lived in a semi-wild state and the breed consequently deteriorated. Of late years efforts have been made to improve the breed and there are many large and up-to-date studs where scientific horse breeding is carried on with great success. Some of these studs are devoted to the breeding of thorough bred stock only, for racing purposes, and others are devoted to the

breeding of hunters, saddle and carriage horses and heavy draught horses, sires of various strains being imported and crossed with selected country-bred mares. It is from this latter category that the majority of animals suitable for artillery purposes would have to be selected.

Owing to their great variety and the tremendous differences in quality which the country-bred animals present, it is a matter of impossibility to find a type which is generally suitable for artillery purposes and it is necessary to consider each animal individually on its merits, and even so it is difficult to get together a reasonably level lot. The majority of horses are very broken, Argentine methods being excessively brutal and by no means thorough: consequently the animals purchased require a long training before they can be considered fit to be handed over to a Battery.

The price for suitable artillery horses averages about 300 dollars, delivered at Buenos Aires (i.e. about £27.)

The article contains much useful information as to the best season for buying and importing horses, methods of procedure, etc.



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